STÖBER ANTRIEBSTECHNIK

APPLICATION

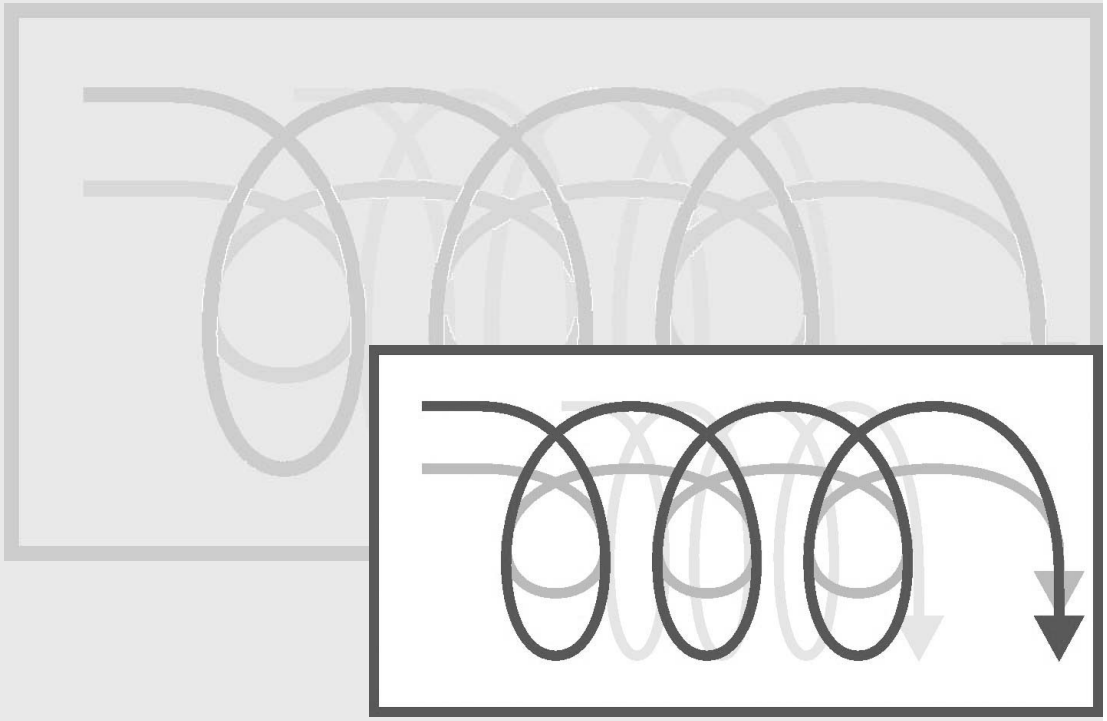
Comfort Reference Value

FUNCTIONS

DETAILS

PARAMETER

5th Generation of STÖBER Inverters



V 5.3

04/2007 GB

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1 NOTES ON SAFETY

This manual contains information which must be adhered to in order to prevent personal injury and property damage. This information is graduated by degree of damage as shown below.

ATTENTION

Means that an undesired result or undesired state may occur if this note is not heeded.

CAUTION

Without warning triangle: Means that property damage may occur if appropriate precautions are not taken.

CAUTION

With warning triangle: Means that minor personal injury and property damage may occur if appropriate precautions are not taken.

WARNING

Means that major danger of death and substantial property damage **may** occur if appropriate precautions are not taken.

DANGER

Means that great danger to life and substantial property damage **will** occur if appropriate precautions are not taken.

NOTE

Indicates an important piece of information on the product or the drawing of attention to a part of the documentation requiring special attention.

ACTION

Means the description of an action which is particularly important for handling the product.

1.1 Hardware

WARNING

To ensure that avoidable problems do not occur during commissioning and/or operation, be sure to read these installation and commissioning instructions before installation and commissioning.

In the sense of DIN EN 50178 (formerly VDE 0160), the FDS and MDS model series of POSIDRIVE® are electrical components of power electronics for the regulation of energy flow in high-voltage systems. They are exclusively designed to power servo (MDS) and asynchronous (FDS, MDS) machines. Utilization, installation, operation and maintenance are only permitted under observation and adherence to valid regulations and/or legal requirements, applicable standards and this technical documentation.
This is a product of the restricted sales class in accordance with IEC 61800-3. In a residential zone, this product may cause high-frequency interference in which case the user may be requested to take suitable measures.

Strict adherence to all rules and regulations must be ensured by the user.

The safety notes contained in further sections (items) and specifications must be adhered to by the user.

WARNING

Caution! High touch voltage! Danger of shock! Danger to life!

When network voltage is applied, never under any circumstances open the housing or disconnect the connections. When installing or removing option boards, you may only open the inverter in the dead state (all power plugs disconnected) and only after a waiting period of at least 5 minutes after the network voltage is switched off. Prerequisite for the correct functioning of the inverter is the correct configuration and installation of the inverter drive. Transport, installation, commissioning and handling of the device may only be performed by qualified personnel who have been especially trained for these tasks.

Pay particular attention to the following:

- Permissible protection class: Protective ground. Operation is only permitted when the protective conductor is connected in accordance with regulations. Direct operation of the devices on IT networks is not possible.
- Installation work may only be performed in the dead state. For work on the drive, lock enable and disconnect the complete drive from the power. (Observe the 5 safety rules.)
- Leave the plug for the DC link coupling connected even when the DC link coupling is not being used (BG0-BG2: X22)!
- Discharge time of the DC link capacitors > 5 minutes.
- Do not penetrate the device's interior with any kind of object.
- During installation or any other work in the switching cabinet, protect the device against falling parts (pieces of wire, stranded wire, pieces of metal, and so on). Parts with conductive properties may cause a short circuit within the inverter or device failure.
- Before commissioning, remove extra coverings so that the device cannot overheat.

The inverter must be installed in a switching cabinet in which the maximum ambient temperature (see technical data) is not exceeded. Only copper lines may be used. The line cross sections to be used are contained in table 310-16 of the NEC standard at 60 °C or 75 °C.

The company STÖBER ANTRIEBSTECHNIK GmbH + Co. KG accepts no liability for damages resulting from non-adherence to the instructions or the particular regulations.

The motor must have an integral temperature monitor with basis insulation as per EN 61800-5-1 or external motor overload protection must be used.

Only suitable for use on supply current networks which cannot deliver more than a maximum symmetric, nominal, short-circuit current of 5000 A at 480 Volt.

Subject to technical changes without prior notification which changes serve to improve the devices. This documentation is purely a product description. It does not represent promised properties in the sense of warranty law.

1.2 Software

Use of the POSITool software

The POSITool software package can be used to select an application, adjust parameters and signal monitoring of the 5th generation of STÖBER inverters. The functionality is specified by the selection of an application and the transmission of these data to an inverter.

The program is the property of STÖBER ANTRIEBSTECHNIK GmbH + Co. KG and is protected by copyright. The program is licensed for the user.
The software is provided exclusively in machine-readable format.
The customer receives from STÖBER ANTRIEBSTECHNIK GmbH + Co. KG a non-exclusive right to use the program (license) if the program was obtained legally.
The customer has the right to utilize the program for the above stated activities and functions and to make and install copies of the program, including one backup copy, for support of said utilization.

The conditions of this license apply to all copies. The customer is obligated to place the copyright note and all other ownership notes on every copy of the program.
The customer is not authorized to use, copy, change or pass on/transmit the program for reasons other than those covered by these conditions; the customer is also not authorized to convert the program (reverse assembly, reverse compilation) or compile the program in any other manner, or to sublicense, rent or lease the program.

Product maintenance

The obligation to perform maintenance applies to the two last current program versions prepared and released for use by STÖBER ANTRIEBSTECHNIK GmbH + Co. KG. STÖBER ANTRIEBSTECHNIK GmbH + Co. KG can either correct program errors or provide a new program version. The choice is up to STÖBER ANTRIEBSTECHNIK GmbH + Co. KG. If, in individual cases, the error cannot be corrected immediately, STÖBER ANTRIEBSTECHNIK GmbH + Co. KG will provide an intermediate solution which, if necessary, requires adherence by the user to special operating regulations.

The claim to error correction only exists when reported errors are reproducible or can be recorded by machine-made outputs. Errors must be reported in reconstructable form giving useful information for error correction.

The obligation to correct errors is invalidated for such programs which the customer changes or manipulates unless the customer can prove when reporting the error that the manipulation is not the cause of the error.
STÖBER ANTRIEBSTECHNIK GmbH + Co. KG is obligated to keep the currently valid program versions in a specially protected place (fire-resistant data safe, safety deposit box at a bank).

2 INTRODUCTION

Introduction

The Comfort Reference Value application gives you a wide variety of functionalities for speed and torque operation. You can select from the following available types of reference values:

- Speed reference value
- Torque reference value
- Switch between speed and torque reference values during operation
- Switch between master/slave drive (i.e., the switch between an internal speed reference value and the reference value of a master drive or in other words a master reference value). The master can specify a speed or a torque reference value. The internal reference value is always a speed reference value.

Reference value interfaces such as analog reference values, preset reference values or motor potentiometers are available for the different types of reference values. In addition you can use skip-speeds, comparators and other supplemental functions.

The Comfort Reference Value Assistant

Since this description is based on the structure of the Comfort Reference Value Assistant, STÖBER Antriebstechnik recommends studying the Assistant together with this description for better comprehension.

To access the Assistant, open the Comfort Reference Value application in POSITool.

Input and output signals

You will find comprehensive information on input and output signals in the signal tables at the end of some of the sections. The signal tables are organized as follows.

Binary input signals

In addition to the designation and a description the signal tables for binary inputs contain the selection parameter (**Selector**) in which you can set the signal source. You can choose between a binary input or fieldbus (setting *2:parameter*). If you select fieldbus the column **Fieldbus Image** shows you the address to which you write the signal.

The column **Display Parameter** shows you the signal status regardless of the source which is set in the selector.

In addition a switch-on or switch-off delay can be parameterized for some of the binary input signals. You will find the parameters in which the delay times are to be entered in the column **Time ON** or **Time OFF**.

Analog input signals

In addition to the designation and description you will also find the specification of **Selector**, **Fieldbus Image** and **Display Parameter** for analog input signals. You can use the parameter specified as Fieldbus image to obtain a constant value during operation. Set the Selector to *4:parameter* and enter the desired value in this parameter. The link to a fieldbus system is not necessary in this case.

In addition a characteristic curve scaling can be performed for some of the signals. You will find the scaling parameters in the **Scaling** column. The applicable description explains how to perform characteristic curve scaling.

Status signals

The designation and description are also to be found in the tables of the binary status signals. The column **Fieldbus Image** shows the address from which the signal can be read via fieldbus. The column **Single Parameter** gives you the parameter to be used to indicate the signal on a binary output.

3 SELECTING THE TYPE OF REFERENCE VALUE

Information that you will find in this chapter …

This chapter gives you information on:

- what a reference value is and the types of reference values which are provided by the Comfort Reference Value application
- how to select the type of reference value and
- further details for the types of reference values are present

Types of reference values

The type of motor control is called the type of reference value. The Comfort Reference Value application offers you a choice of the following types of reference values.

- Speed reference value (i.e., control of the motor speed). A speed reference value is used for belt drives, pumps and fans, for example.
- Torque reference value (i.e., control of the torque). A torque reference value is used for insertion and for screw driving, for example.
- Switching between speed and torque reference value (i.e., switching between speed and torque control during operation). Switching between controls is used for pressure rollers, for example.
- Switching between master/slave drive (i.e., switching from an internal reference value to a master reference value). The internal reference value is always used as speed reference value. The external reference value can be used as the torque or speed reference value. This type of reference value is used, for example, for a multiple-axis network with slaves which can be turned off.

How to select the type of reference value …

The type of reference value is selected on page 1 of the Comfort Reference Value Assistant (see Figure 3-1). You can activate a type of reference value by activating the related option box.

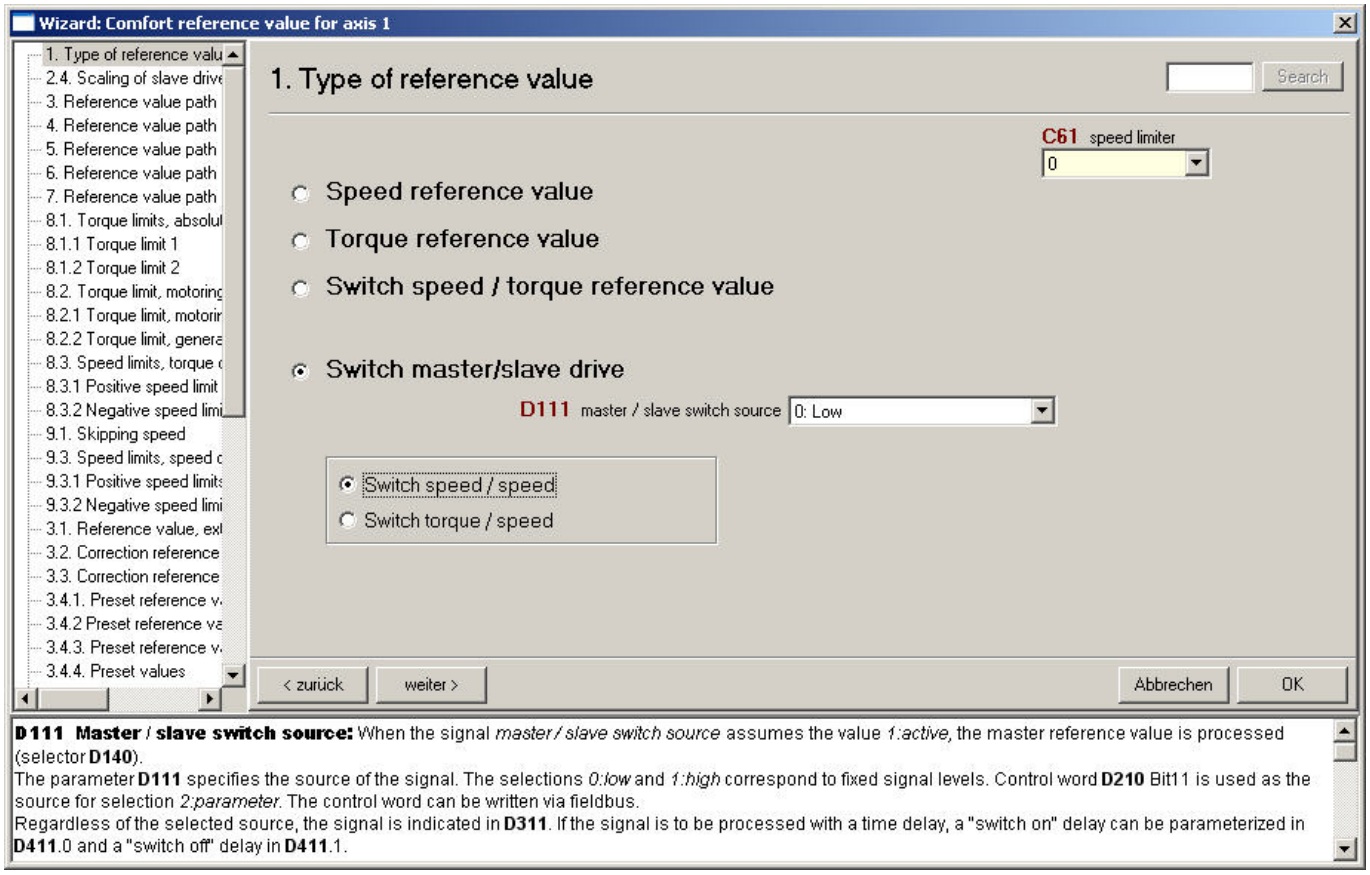
Wizard: Comfort reference value for axis 1
1. Type of reference valu
2.4. Scaling of slave drive
3. Reference value path
4. Reference value path
5. Reference value path
6. Reference value path
7. Reference value path
8.1. Torque limits, absolut
8.1.1 Torque limit 1
8.1.2 Torque limit 2
8.2. Torque limit, motoring
8.2.1 Torque limit, motorir
8.2.2 Torque limit, genera
8.3. Speed limits, torque
8.3.1 Positive speed limit
8.3.2 Negative speed limi
9.1. Skipping speed
9.3. Speed limits, speed
9.3.1 Positive speed limits
9.3.2 Negative speed limi
3.1. Reference value, ext
3.2. Correction reference
3.3. Correction reference
3.4.1. Preset reference v
3.4.2 Preset reference va
3.4.3. Preset reference v
3.4.4. Preset values
1. Type of reference value
Search
C61 speed limiter
0
Speed reference value
Torque reference value
Switch speed / torque reference value
Switch master/slave drive
D111 master / slave switch source
0: Low
Switch speed / speed
Switch torque / speed
< zurück
weiter >
Abbrechen
OK
D111 Master / slave switch source: When the signal master / slave switch source assumes the value 1:active, the master reference value is processed (selector D140).
The parameter D111 specifies the source of the signal. The selections 0:low and 1:high correspond to fixed signal levels. Control word D210 Bit11 is used as the source for selection 2:parameter. The control word can be written via fieldbus.
Regardless of the selected source, the signal is indicated in D311. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in D411.0 and a "switch off" delay in D411.1.

Figure 3-1 Comfort Reference Value Assistant (page 1): Selection of the type of reference value

How to switch between speed and torque reference values

If you choose to switch controls during operation, page 1 of the Assistant indicates the parameter **D112** (Figure 3-2). In Selector **D112** select a signal source (binary input or fieldbus parameter). You can then switch between the types of control during operation with this signal. Speed control is used for a low level while torque control is used for a high level.

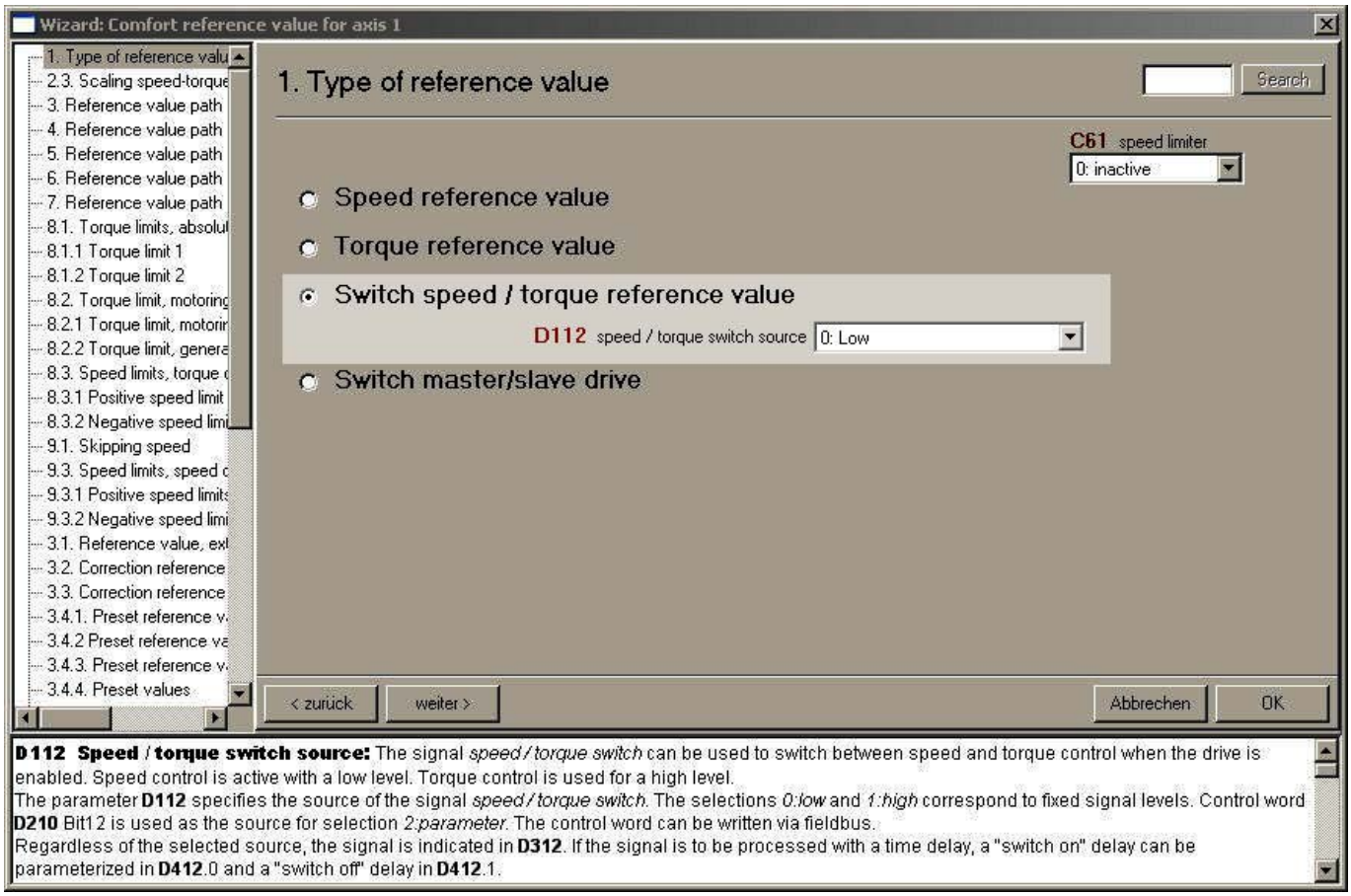
Wizard: Comfort reference value for axis 1
1. Type of reference valu
2.3. Scaling speed-torque
3. Reference value path
4. Reference value path
5. Reference value path
6. Reference value path
7. Reference value path
8.1. Torque limits, absolut
8.1.1 Torque limit 1
8.1.2 Torque limit 2
8.2. Torque limit, motoring
8.2.1 Torque limit, motorir
8.2.2 Torque limit, genera
8.3. Speed limits, torque
8.3.1 Positive speed limit
8.3.2 Negative speed limi
9.1. Skipping speed
9.3. Speed limits, speed
9.3.1 Positive speed limits
9.3.2 Negative speed limi
3.1. Reference value, ext
3.2. Correction reference
3.3. Correction reference
3.4.1. Preset reference v
3.4.2 Preset reference va
3.4.3. Preset reference v
3.4.4. Preset values
1. Type of reference value
Search
C61 speed limiter
0: inactive
Speed reference value
Torque reference value
Switch speed / torque reference value
D112 speed / torque switch source
0: Low
Switch master/slave drive
< zurück
weiter >
Abbrechen
OK
D112 Speed / torque switch source: The signal speed / torque switch can be used to switch between speed and torque control when the drive is enabled. Speed control is active with a low level. Torque control is used for a high level.
The parameter D112 specifies the source of the signal speed / torque switch. The selections 0:low and 1:high correspond to fixed signal levels. Control word D210 Bit12 is used as the source for selection 2:parameter. The control word can be written via fieldbus.
Regardless of the selected source, the signal is indicated in D312. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in D412.0 and a "switch off" delay in D412.1.

Figure 3-2 Setting for the speed/torque reference value switchover

How to switch between master/slave drive

If you use the switchover between master and slave drive, the parameter **D111** and additional option boxes appear (Figure 3-3). Select a signal source in this parameter (binary input or fieldbus parameter). You can then switch between master and slave during operation with this signal. The internal speed reference value is used for a low level. With a high level the drive uses the master reference value.

With the other option boxes you can choose a speed/speed or torque/speed switchover. If you use the torque/speed switchover the master reference value is evaluated as the torque reference value.

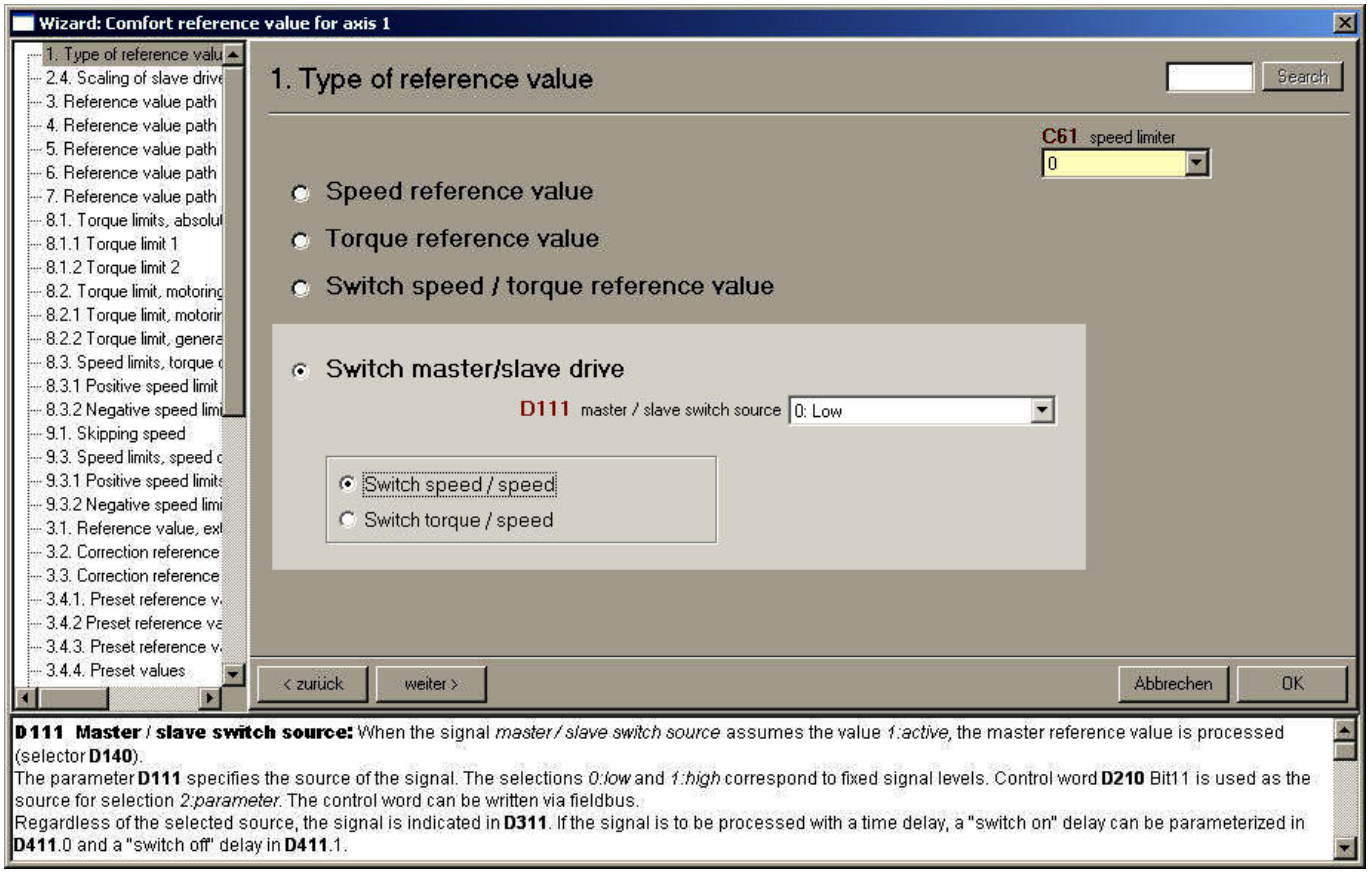
Wizard: Comfort reference value for axis 1
1. Type of reference value
Search
C61 speed limiter
0
Speed reference value
Torque reference value
Switch speed / torque reference value
Switch master/slave drive
D111 master / slave switch source
0: Low
Switch speed / speed
Switch torque / speed
< zurück
weiter >
Abbrechen
OK
D111 Master / slave switch source: When the signal master / slave switch source assumes the value 1:active, the master reference value is processed (selector D140).
The parameter D111 specifies the source of the signal. The selections 0:low and 1:high correspond to fixed signal levels. Control word D210 Bit11 is used as the source for selection 2:parameter. The control word can be written via fieldbus.
Regardless of the selected source, the signal is indicated in D311. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in D411.0 and a "switch off" delay in D411.1.

Figure 3-3 Setting for the master/slave drive switchover

Details

Page 1 of the Comfort Reference Value Assistant affects the parameter **C61**. This parameter is used to specify whether speed or torque control will be used.

With a speed reference value, **C61** is set to *0:inactive*. With a torque reference value, **C61** is set to *1:active*.

When switching between speed and torque control is used the switch is made with the signal selected in **D112**.

When the type "master/slave drive" reference value is used with the switchover speed/speed, **C61** is set to *0:inactive*. With the speed/torque switchover, **C61** is set to *1:active*. The specification of whether torque control or speed control is to be used is made with the signal selected in **D111**. Speed control is used with a low level while torque control is used with a high level.

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Master/slave switchover	With a high level, a switch is made to the master reference value (**D140**).	**D111**	**D210 Bit11**	**D311**	**D411.0**	**D411.1**
Speed/torque switchover	Binary signal for switching between speed and torque control. Speed control is used with a low level. Torque control is active with a high level.	**D112**	**D210 Bit12**	**D312**	**D412.0**	**D412.1**

Table 3-1 Signal table for selection of the type of reference value

4 REPRESENTING THE REFERENCE VALUES IN USER UNITS

Information that you will find in this chapter …

This chapter gives you information on:

- what user units are
- how to scale your reference value in user units

User units

To simplify presentation, reference values can be indicated in user units in the Comfort Reference Value application (e.g., bottles per second on a bottle conveyor belt). All ratios of the motor speed are covered by this.

The user units are calculated in the Comfort Reference Value Assistant. Since calculation depends on the type of reference value used, go to page "1. Type of Reference Value" first and select one of the options offered there. After that you can perform the calculation on the next page.

Calculation of each type of reference value is described in a separate section below.

NOTE

Remember that scaling only has to be performed when you want to present display values in user units.

If presentation in rpm units is sufficient, the scaling described in the next few sections is unnecessary. If this is the case, skip chapter 4 and continue reading in chapter 5.

4.1 User Units with a Speed Reference Value

Information that you will find in this section …

This section describes how to scale a speed reference value in user units. Before you can begin scaling you must have activated the speed reference value on page 1 of the Assistant.

Scaling the reference value

Figure 4-1 shows page 2.1 of the Assistant. It presents the organization of a machine with motor, gear unit and other ratios.

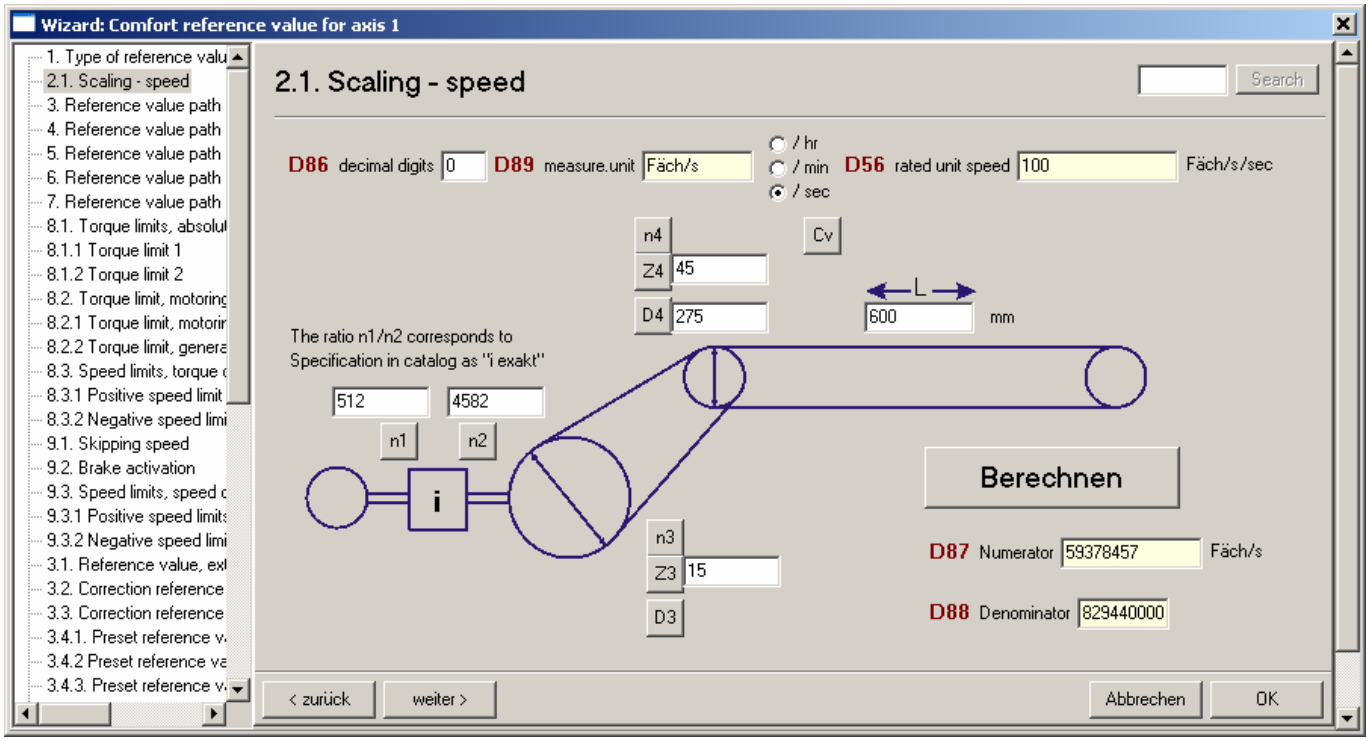

Figure 4-1 Scaling for the speed-type reference value

First, edit the parameters on the top of the page (Figure 4-2):

- In **D86** specify the number of decimal digits with which speeds are to be represented.
- In **D89** enter the desired unit of measurement for the speed (e.g., compartments per second). Remember that not more than 8 characters can be entered.
- Activate the option box as per your entry in **D89** so that the time reference can be correctly calculated internally.
  Example: You have entered compartments/second in **D89**. In this case you would activate the option box "/sec."
- Enter the rated speed of the machine in **D56** (necessary for percental reference values).

Figure 4-2 Parameters for scaling in user units

You can now enter the gear ratios within the lower range of the page (Figure 4-3). There are two ways to do this:

1. You already know the mathematical relationship between the speed of the motor in rpm and the speed of the machine in user units. If this is the case, enter the ratio directly in **D87** numerator (machine speed) and **D88** denominator (motor speed).
2. You do not yet know the relationship. If this is the case, the Assistant will help you with the calculation. Proceed as described below:

- Enter the ratio of the gear unit installed on the motor. Enter as precise a value as possible to prevent rounding errors. You will find the precise ratios in the catalogs for STÖBER ANTRIEBSTECHNIK GmbH+Co. KG gear units.
- You can parameterize another ratio in the boxes n3 and n4 (ratio of the speeds), Z3 and Z4 (ratio of the numbers of teeth) or D3 and D4 (ratio of the diameters). If there are no further ratios in addition to the gear unit on the motor, enter the ratio 1:1 in the boxes.
- The last step is the conversion of the speed after the last ratio in user units has been entered. Enter the format length in mm (e.g., the format length of one bottle). Then parameterize either D4 or the feed constant Cv (distance/revolution of the driven gear).
- Press the button “Calculate” (Berechnen). You will then find the results in **D87** und **D88**.

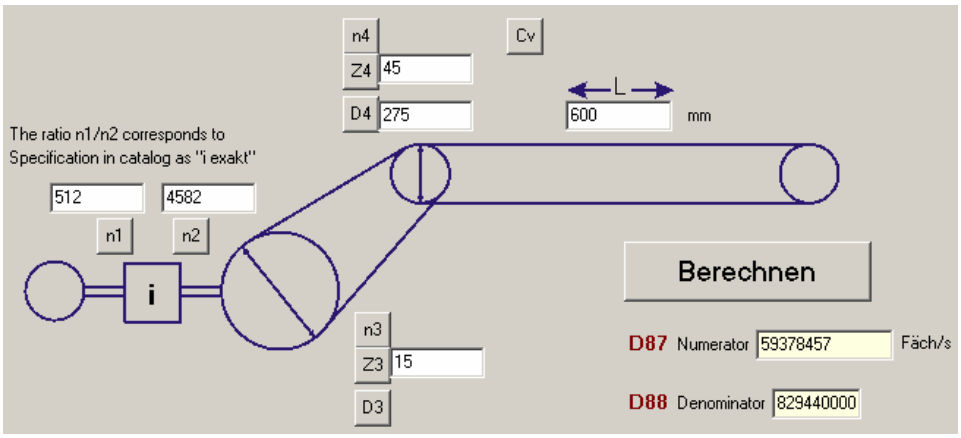

Figure 4-3 Conversion of motor speed to machine speed

4.2 User Units for a Torque Reference Value

Information that you will find in this section …

This section describes how to scale a torque reference value in user units. Before you can begin scaling you must have activated the torque reference value on page 1 of the Assistant.

Scaling the reference value

Figure 4-4 shows page 2.2 of the Assistant. It presents the structure of a machine with motor, gear unit and other ratios.

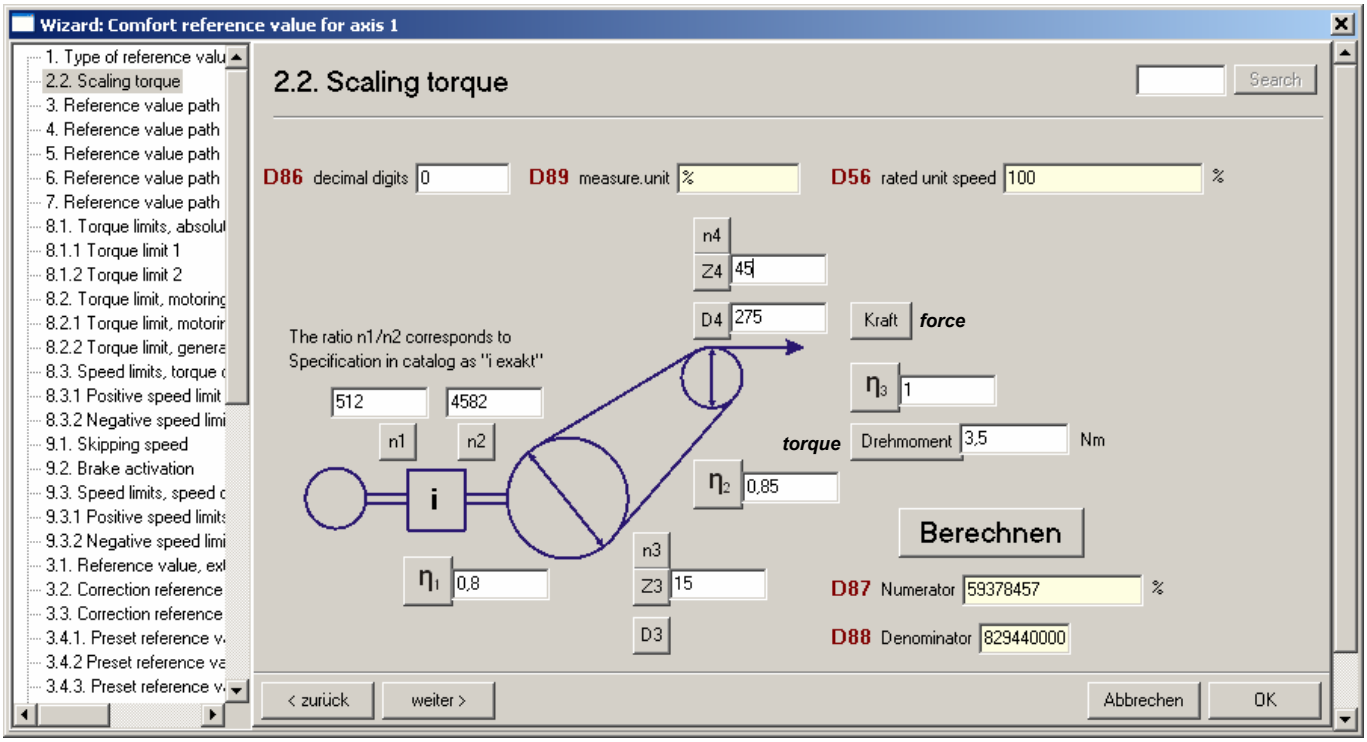

Figure 4-4 Scaling in the torque-type reference value

First, edit the parameters on the top of the page (Figure 4-5):

- In **D86** specify the number of decimal digits with which torques are to be represented.
- In **D89** enter the desired unit of measurement for the torque or the force (e.g., in %). Remember that not more than 8 characters can be entered.
- Enter the rated torque of the machine in **D56**.

Figure 4-5 Parameter **D86**, **D89** and **D56**

You can now enter the gear ratios within the lower range of the page (Figure 4-6). There are two ways to do this:

1. You already know the mathematical relationship between the torque of the motor and the machine in user units. If this is the case, enter the ratio directly in **D87** numerator (torque on output) and **D88** denominator (motor torque).
2. You do not yet know the relationship. If this is the case, the Assistant will help you with the calculation. Proceed as described below:

- Enter the ratio of the gear unit installed on the motor and degree of efficiency. Enter as precise a value as possible to prevent rounding errors. You will find the precise ratios in the catalogs for STÖBER ANTRIEBSTECHNIK GmbH+Co. KG gear units.
- You can parameterize another ratio in the boxes n3 and n4 (ratio of the speeds), Z3 and Z4 (ratio of the numbers of teeth) or D3 and D4 (ratio of the diameters). Also enter a degree of efficiency for this ratio. If there are no further ratios in addition to the gear unit on the motor, enter the ratio as 1:1 and the degree of efficiency as 1 in the boxes.
- The last step is the conversion of the torques after the last ratio in user units has been entered. Click either the “Force” (Kraft) box or the “Torque” (Drehmoment) box. Then enter the conversion factor between force or torque and the user unit in the input fields.
  Example:
  3.5 Nm corresponds to one user unit.
  In this case click the “Torque” (Drehmoment) box and enter the factor 3.5 in the input field.
- Press the button “Calculate” (Berechnen). You will then find the results in **D87** und **D88**.

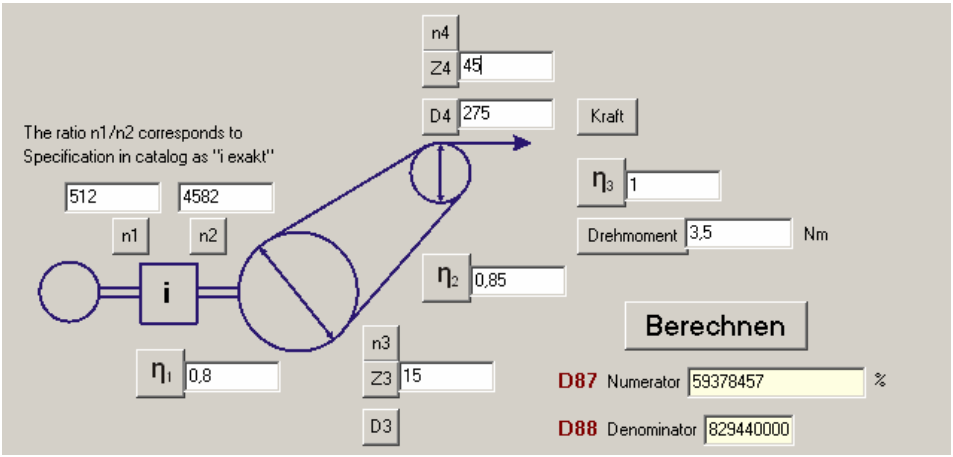

Figure 4-6 Calculation of the ratio

4.3 Switching between the Speed/Torque Reference Value

Information that you will find in this section …

This section explains how to scale reference values after you have activated the switch between speed and torque reference value (Umschaltung Drehzahl-/Momentsollwert) on page 1 of the Assistant.

Scaling the reference value

Figure 4-7 shows page 2.3 of the Assistant. You can only scale this type of reference value in % which means that you don't need to do extensive scaling for speed and torque mode.

Proceed as shown below:

- In **D86** specify the number of decimal digits with which speeds are to be represented.
- Enter "%" in **D89**.
- Enter 100% in **D56**.
- Enter a percentage in **D87** and parameterize the appropriate speed in **D88**.
  Example:
  D87= 50%, **D88** = 1000
  This gives you a reference value of 50% of a speed of 1000 Rpm.

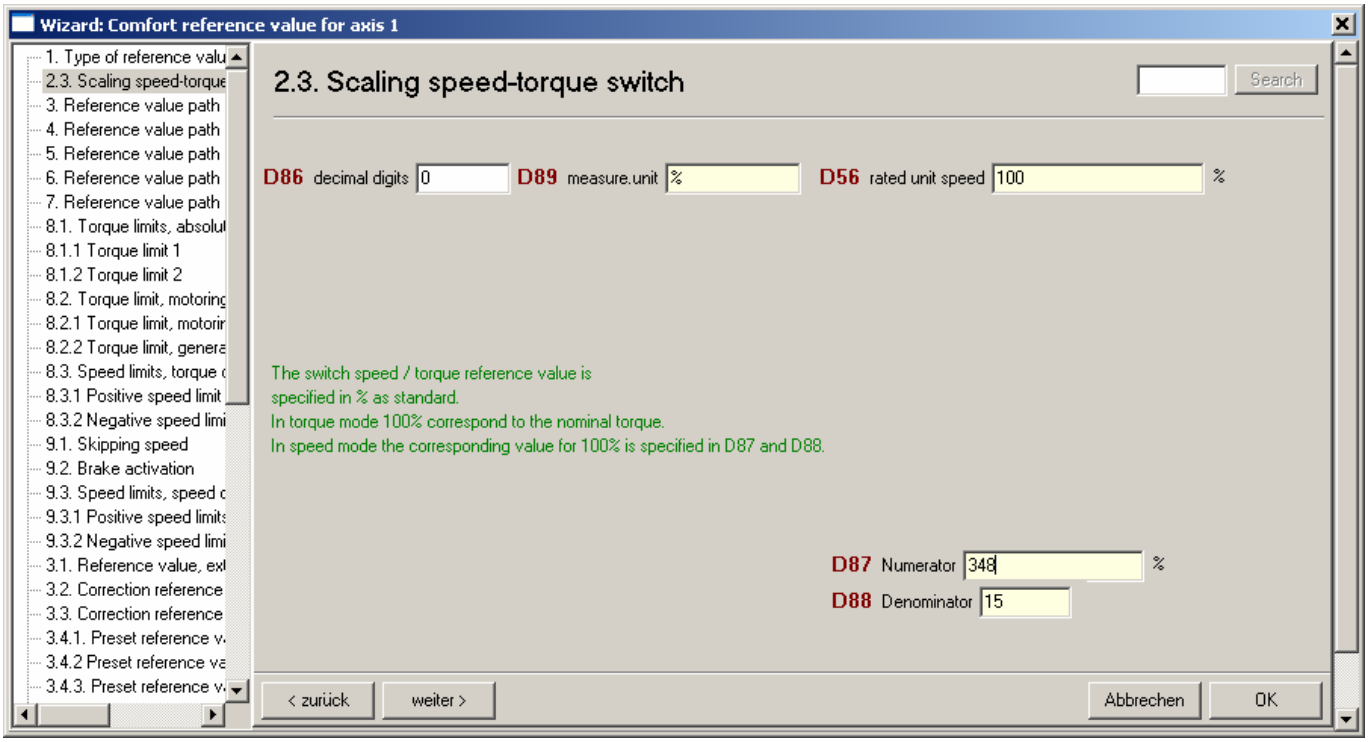
Wizard: Comfort reference value for axis 1
1. Type of reference valu
2.3. Scaling speed-torque
3. Reference value path
4. Reference value path
5. Reference value path
6. Reference value path
7. Reference value path
8.1. Torque limits, absolut
8.1.1 Torque limit 1
8.1.2 Torque limit 2
8.2. Torque limit, motoring
8.2.1 Torque limit, motorir
8.2.2 Torque limit, genera
8.3. Speed limits, torque
8.3.1 Positive speed limit
8.3.2 Negative speed limi
9.1. Skipping speed
9.2. Brake activation
9.3. Speed limits, speed
9.3.1 Positive speed limits
9.3.2 Negative speed limi
3.1. Reference value, ext
3.2. Correction reference
3.3. Correction reference
3.4.1. Preset reference v
3.4.2 Preset reference va
3.4.3. Preset reference v
2.3. Scaling speed-torque switch
Search
D86 decimal digits 0
D89 measure.unit %
D56 rated unit speed 100 %
The switch speed / torque reference value is
specified in % as standard.
In torque mode 100% correspond to the nominal torque.
In speed mode the corresponding value for 100% is specified in D87 and D88.
D87 Numerator 348 %
D88 Denominator 15
< zurück
weiter >
Abbrechen
OK

Figure 4-7 Scaling for reference value type "speed/torque switchover"

4.4 Switching between Master/Slave Drive in Speed/Speed Mode

Information that you will find in this section …

This section explains how to scale the reference values in user units with a master/slave drive with speed/speed switchover. Before you can begin scaling you must have activated "switch master/slave drive" with “speed/speed switchover” (Umschaltung Drehzahl/Drehzahl) on page 1 of the Assistant.

Scaling the reference value

Figure 4-8 shows page 2.4 of the Assistant. It presents the structure of a machine with motor, gear unit and other ratios.

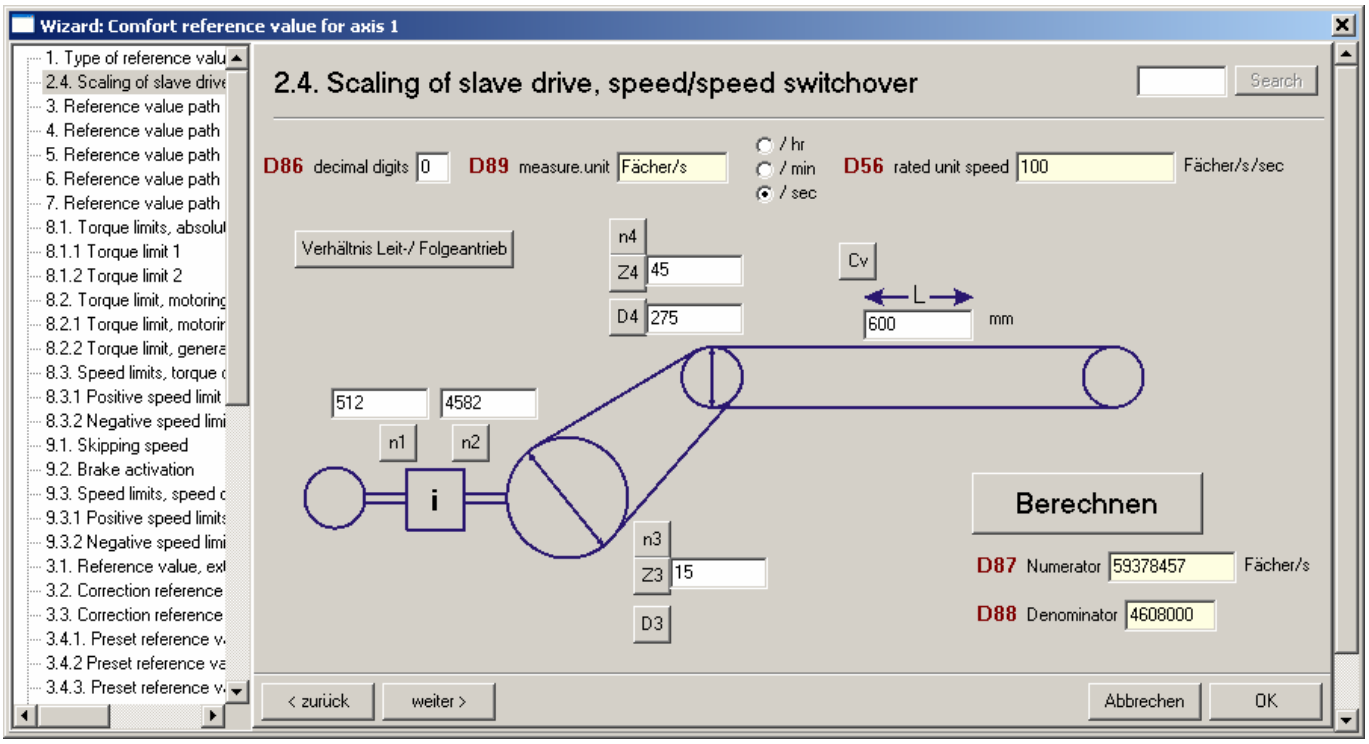

Figure 4-8 Scaling for reference value type "master/slave drive" in "speed/speed" mode

First, edit the parameters on the top of the page (Figure 4-9):

- In **D86** specify the number of decimal digits with which speeds are to be represented.
- In **D89** enter the desired unit of measurement for the speed (e.g., compartments per second). Remember that not more than 8 characters can be entered.
- Activate the option box as per your entry in **D89** so that the time reference can be correctly calculated internally.
  Example: You have entered compartments/second in **D89**. In this case you would activate the option box "/sec" as the time reference.
- Enter the rated speed of the machine in **D56**.

Figure 4-9 Parameter **D86**, **D89** and **D56**

You can now enter the gear ratios within the lower range of the page (Figure 4-10). There are two ways to do this:

1. You already know the mathematical relationship between the speed of the motor in rpm and the speed of the machine in user units. If this is the case, enter the ratio directly in **D87** numerator (machine speed) and **D88** denominator (motor speed).

2. You do not yet know the relationship. If this is the case, the Assistant will help you with the calculation. Proceed as described below:

- Enter the ratio of the gear unit installed on the motor. Enter as precise a value as possible to prevent rounding errors. You will find the precise ratios in the catalogs for STÖBER ANTRIEBSTECHNIK GmbH+Co. KG gear units.
- You can parameterize another ratio in the boxes n3 and n4 (ratio of the speeds), Z3 and Z4 (ratio of the numbers of teeth) or D3 and D4 (ratio of the diameters). If there are no further ratios in addition to the gear unit on the motor, enter the ratio as 1:1 in the boxes.
- The last step is the conversion of the speed after the last ratio in user units has been entered. Enter the format length in mm (e.g., format length of a bottle). Then parameterize either D4 or the feed constant Cv (feed length per revolution of the driven gear).
- Press the button “Calculate” (Berechnen). You will then find the results in **D87** und **D88**.

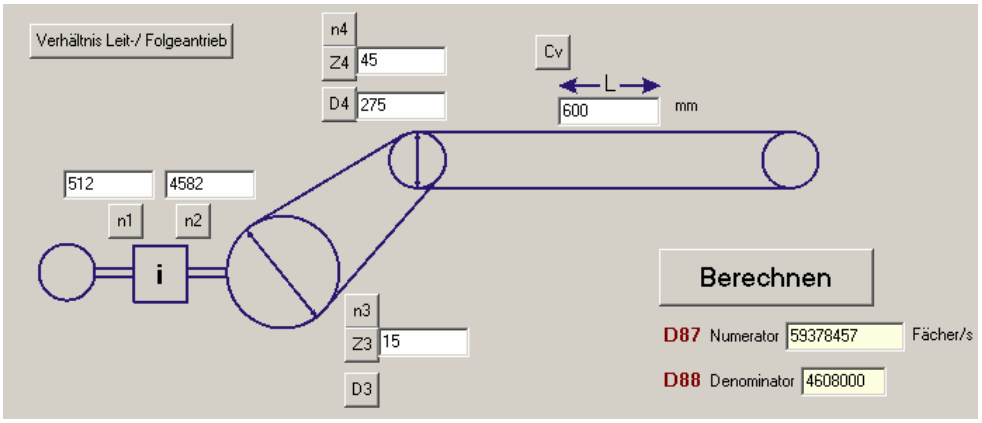

Figure 4-10 Scaling for reference value type "master/slave drive" in "speed/speed" mode

Setting the relationship of master/slave drive

Click the “Ratio of the master/slave drive” (Verhältnis Leit- / Folgeantrieb) button to access page 2.4.1 (Figure 4-11). This page makes it easier to parameterize a 1:1 coupling when the master reference value is connected with an analog input. Proceed as shown below:

- Using a test for the speed of the master, determine the related voltage which the reference value supplies to the slave.
- Enter this value in the first line of page 2.4.1.
- Select an analog input in the parameter **D140**.
- Click the box “Calculate” (Berechnen).

The analog input factor is calculated so that master and slave travel at the same speed (1:1 coupling).

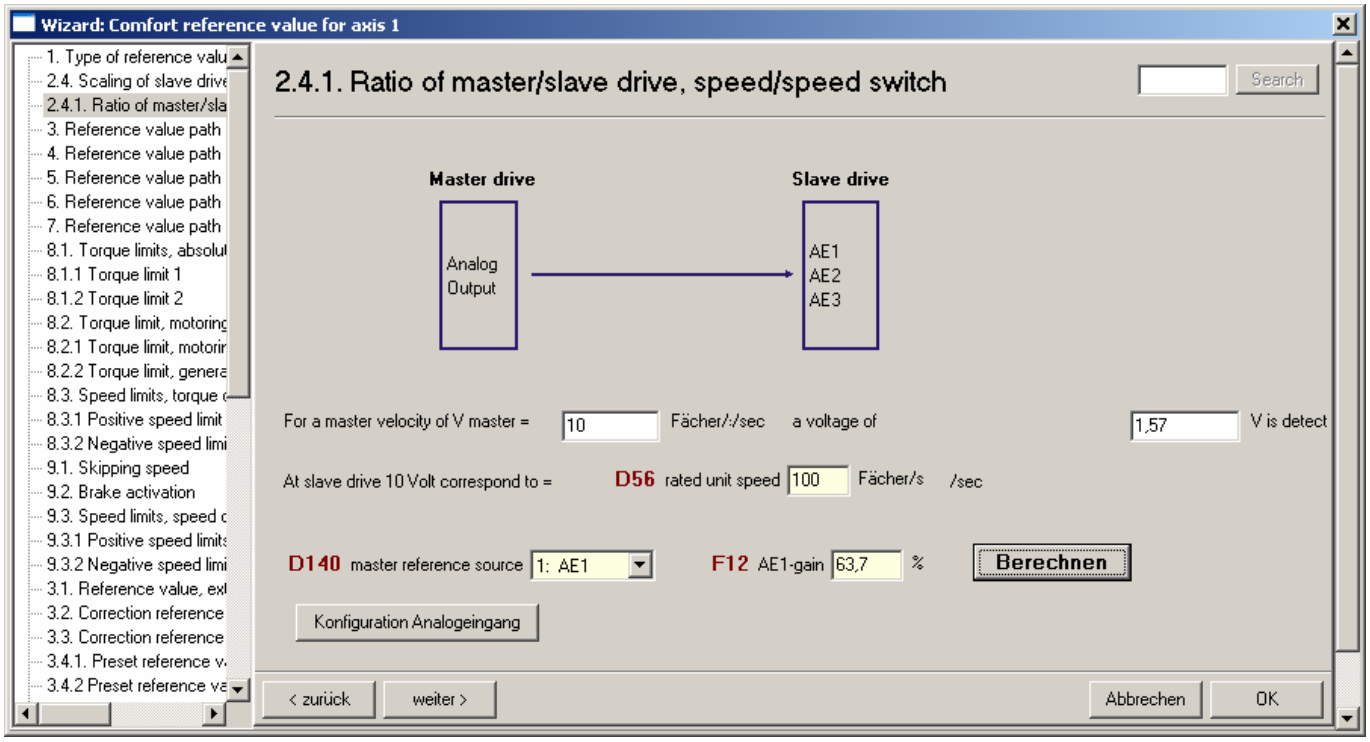

Figure 4-11 Parameterization of the ratio "master/slave drive"

You can access page 2.4.1.A by clicking the button “Configuration of analog input” (Konfiguration Analogeingang) (Figure 4-12). The interface of the master reference value is parameterized on this page if the master reference value is supplied via an analog input. When the master reference value is entered on the inverter by fieldbus, set **D140** = *4:parameter*.

Remember that the information in Figure 4-12 only applies when the analog input has been selected. For details on the settings see the applicable parameter descriptions in the bottom half of the Assistant.

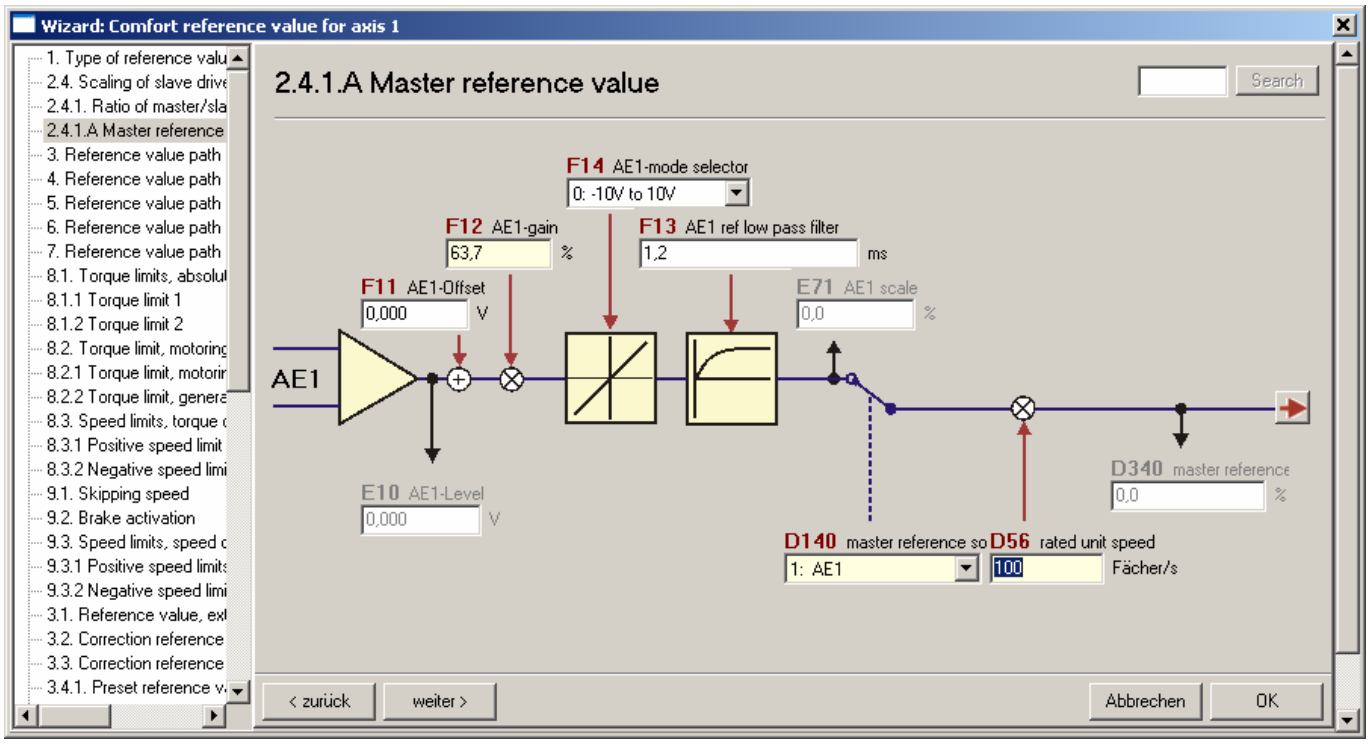

Figure 4-12 Parameterization of the signal source for the master reference value

Analog signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Scaling
Master reference value	The *master reference value* signal can be accessed via analog input or fieldbus. This signal can be used to implement a master-slave operation via an analog coupling.	**D140**	**D240**	**D340**	**-**

4.5 Switching between Master/Slave Drive in Torque/Speed Mode

Information that you will find in this section …

This section shows you how to scale a torque reference value in user units. Before you can begin scaling you must have activated the torque reference value on page 1 of the Assistant.

Scaling the reference value

Figure 4-13 shows page 2.5 of the Assistant. You can only scale this type of reference value in % which means you don't need to do extensive scaling for speed and torque mode.

With asynchronous motors a 100% torque reference value corresponds to the rated torque. With servomotors a 100% torque reference value corresponds to the standstill torque. Scaling of the speed is done in **D87** and **D88**.

Proceed as shown below:

- Specify the accuracy of the representation in **D86**.
- Enter "%" in **D89**.
- Enter 100% in **D56**.
- Enter a percentage in **D87** and parameterize the appropriate speed in **D88**.
  Example:
  D87= 50%, **D88** = 1000
  This gives you at reference value of 50% a speed of 1000 Rpm.

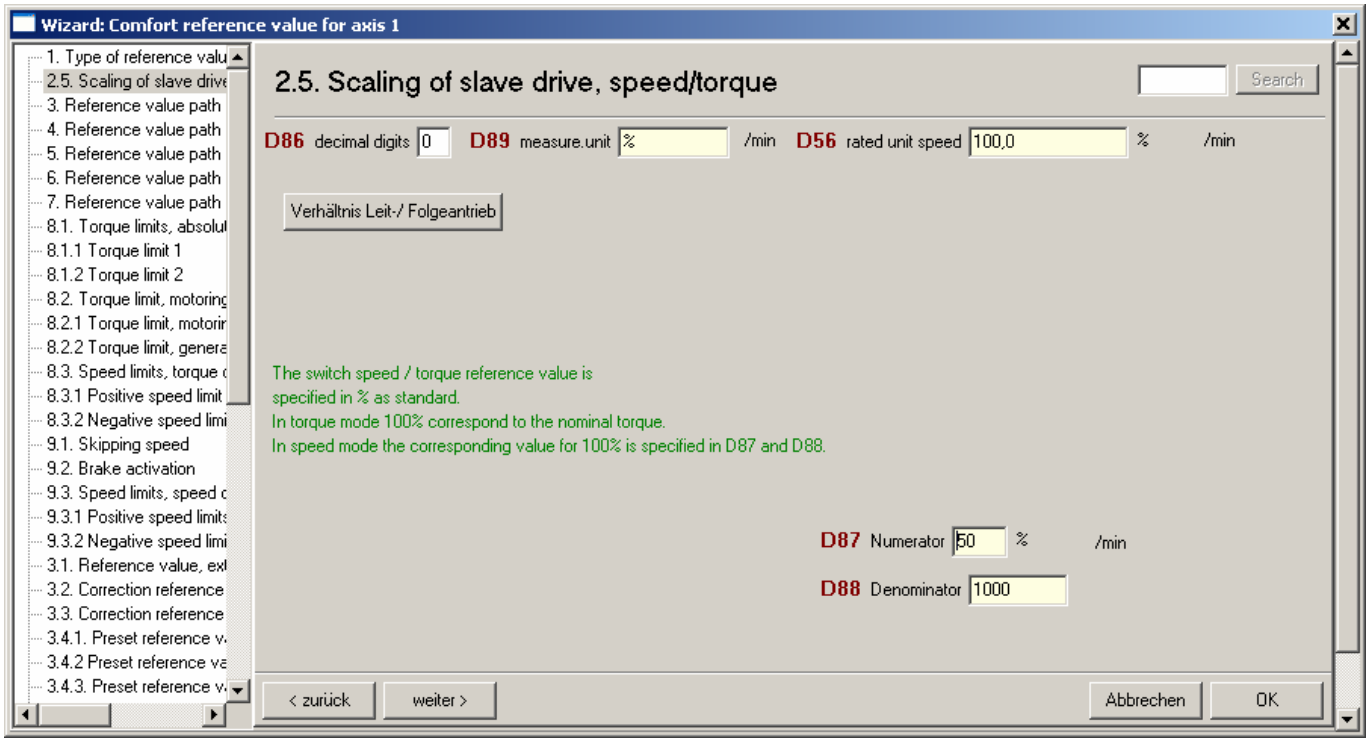

Figure 4-13 Scaling for reference value type "master/slave drive" in "speed/torque" mode

Setting the relationship of master/slave drive

Click the “Ratio of the master/slave drive” (Verhältnis Leit- / Folgeantrieb) button to access page 2.5.1 (Figure 4-14). This page makes it easier to parameterize a 1:1 coupling when the master reference value is connected via an analog input. Proceed as shown below:

- Using a test for a torque of the master, determine the related voltage which the reference value supplies to the slave.
- Enter this value in the first line of page 2.5.1.
- In the second line parameterize the torque which the slave is to provide at 10 V of the master reference value.
- Select an analog input in the parameter **D140**.
- Click the box “Calculate” (Berechnen).

The analog input factor is calculated so that master and slave provide the same torque (1:1 coupling).

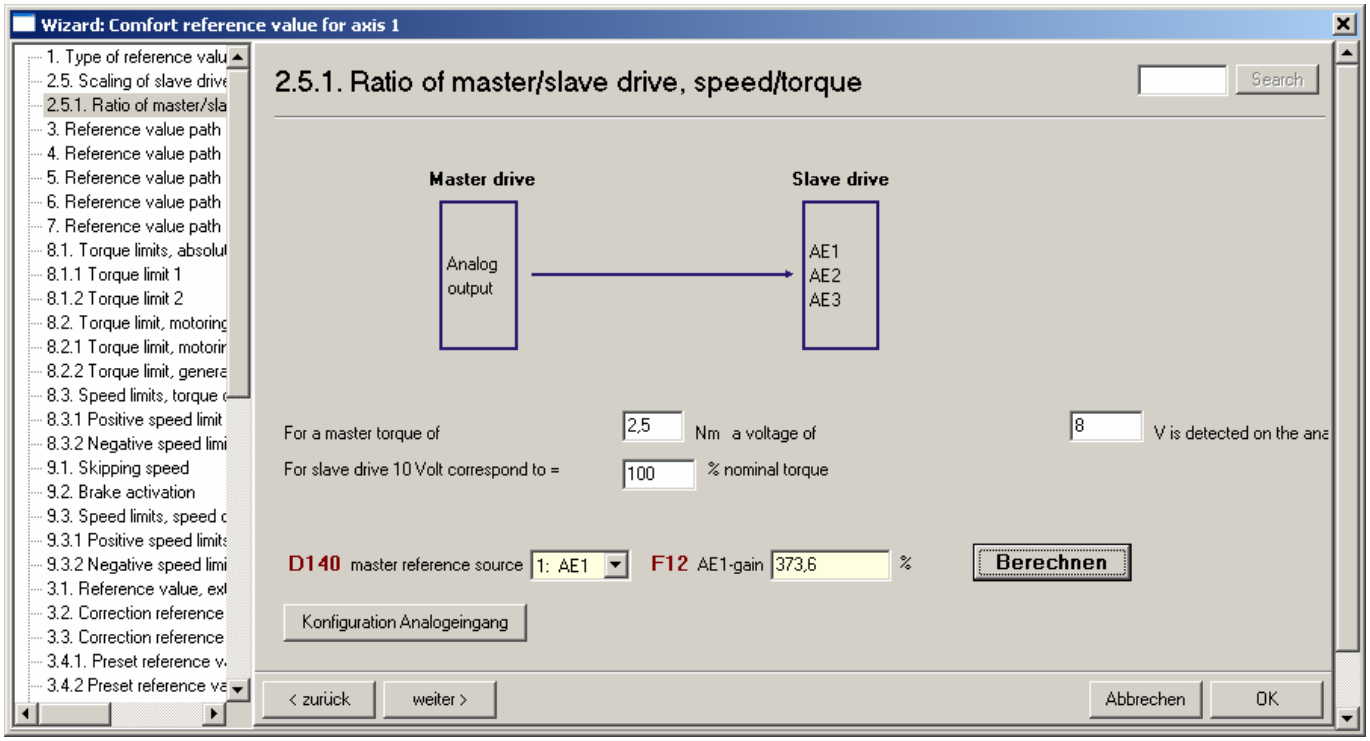

Figure 4-14 Parameterization of the ratio "master/slave drive"

Click the button “configuration of analog input” (Konfiguration Analogeingang) to access page 2.4.1.A (Figure 4-12). You can use this page to parameterize the interface of the master reference value when the master reference value is provided via an analog input. You don't have to edit this page if the master reference value is transferred to the inverter via fieldbus.

Remember that the information in Figure 4-12 only applies when the analog input has been selected. For details on the settings see the applicable parameter descriptions within the lower range of the Assistant.

5 COMBINING THE REFERENCE VALUES

Information that you will find in this chapter …

This chapter gives you information on:

- just what the combination of reference values is
- which combinations are provided by the Comfort Reference Value application
- and how to parameterize the combinations

Reference value combination

After you have parameterized a reference value type and done any desired scaling as described in the previous sections, you can now begin combining the reference values.

Reference value combination means the mathematical linking of different reference values (e.g., the addition of an analog reference value and a preset reference value). The result is evaluated as per the select type of reference value (e.g., as torque reference value).

The following combinations are available:

- Main reference value (unchanged)
- Main reference value + absolute reference value
- Main reference value + percental reference value
- Weighting of the combinations

The following sections describe how to parameterize the specified combinations. Page 3 of the "Comfort Reference Value" Assistant handles the parameterization (Figure 5-1).

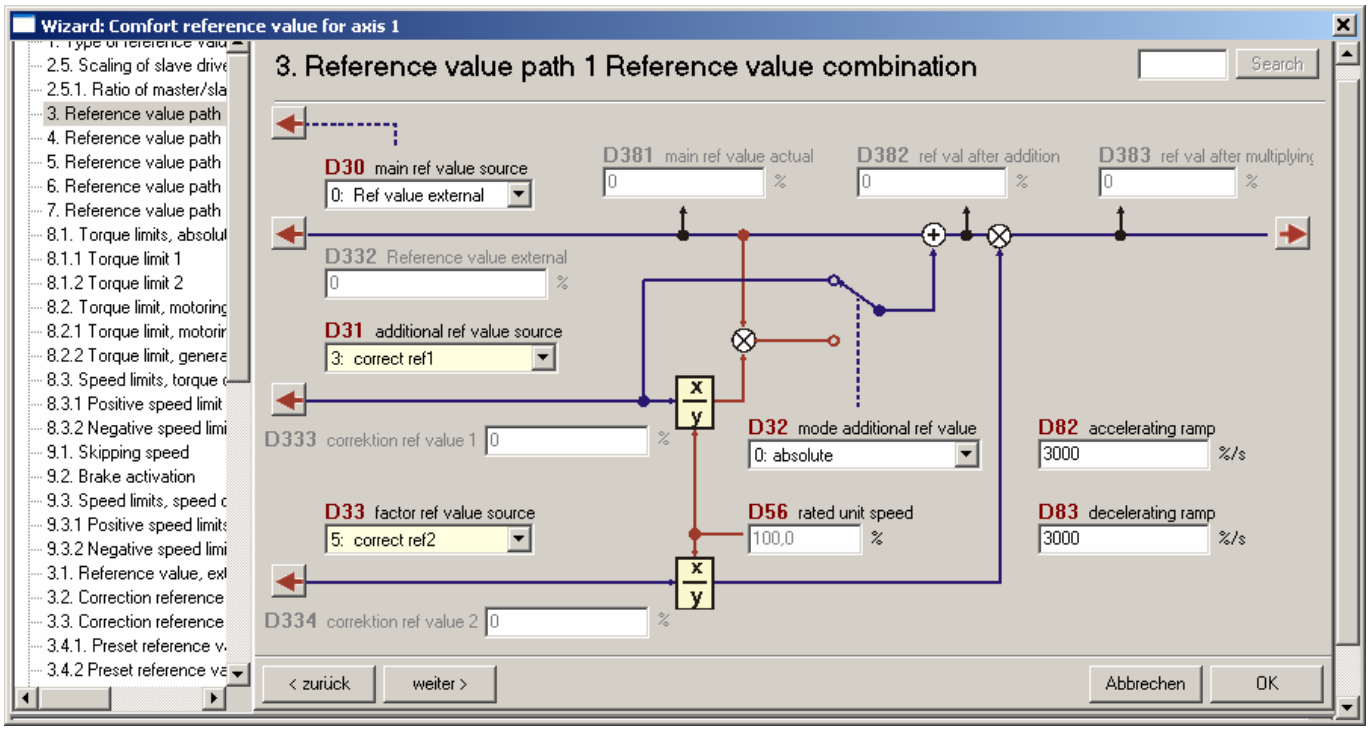

Figure 5-1 Reference value combination

NOTE

The described combinations only apply to the reference value. The ramps of the main reference value are used unchanged in the ramp generator.

5.1 Unchanged Main Reference Value

Information that you will find in this section …

This section shows you how to parameterize a main reference value which cannot be influenced by addition of or multiplication by any other reference value.

Unchanged main reference value

Proceed as shown below to parameterize an unchanged main reference value:

- Select a reference value source in **D30** (e.g., **D30**=*3:Motorpot*).
- Set **D31** and **D33** to "*0:inactive."*

The selected main reference value is transmitted unchanged with this parameterization. Display parameters **D381** and **D382** indicate the same value.

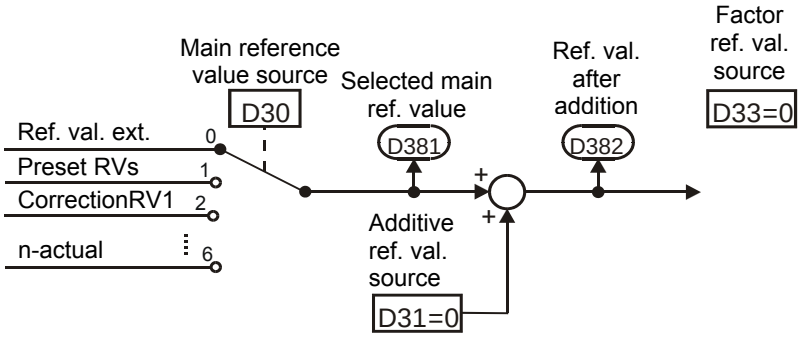

Figure 5-2 Unchanged main reference value

5.2 Main Reference Value + Absolute Reference Value

Information that you will find in this section …

This section shows you how to parameterize a reference value which consists additively of two components.

Main reference value + absolute reference value

Proceed as shown below to parameterize an absolute addition of two reference values (see Figure 5-3):

- Select the desired reference value sources in **D30** and **D31** (e.g., **D30**=*0:reference value external* and **D31**=*2:preset value*).
- Parameterize the value *0: absolut*e in **D32** so that absolute addition will be performed.
- Set **D33**=*0:inactive*.

With this parameterization, the reference values set in **D30** and **D31** are added. **D381** shows the value of the main reference value and **D382** shows the result of the addition.
Example:
The reference value set in **D30** supplies the value 500 Rpm and the value selected in **D31** supplies 250 Rpm. The total result is: 500 Rpm + 250 Rpm = 750 Rpm. 500 Rpm is indicated in **D381** and 750 Rpm is indicated in **D382**.

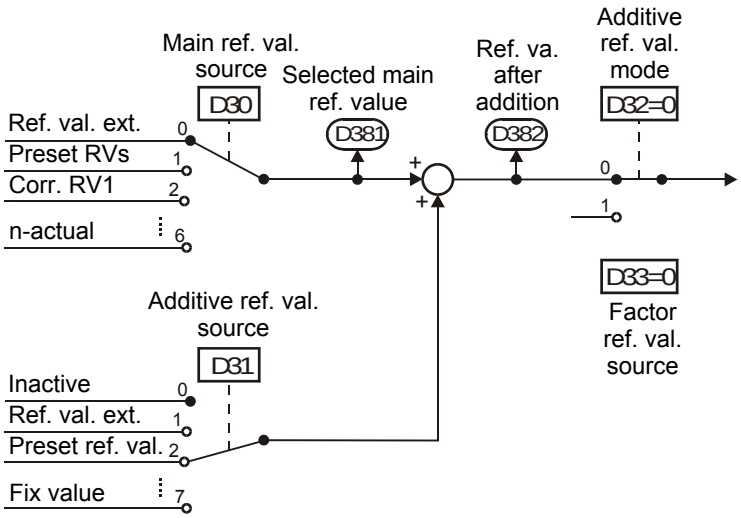

Figure 5-3 Main reference value + absolute reference value

5.3 Main Reference Value + Percental Reference Value

Information that you will find in this section …

This section shows you how to parameterize an additive reference value consisting of two components. One component references the first component as a percentage.

Main reference value + percental reference value

To parameterize this combination proceed as shown below:

- Select the desired reference value sources in **D30** and **D31** (e.g., **D30**=*0:reference value* and **D31**=*2:preset reference value*.
- Set **D32** to "*1:percental"*
- Set **D33**=*0:inactive*.

With this parameterization, the reference value selected in **D31** is related to **D56**. The resulting percentage is multiplied by the main reference value and the result is added to the main reference value (see Figure 5-4).

Example:

The main reference value is 1000 rpm which is indicated in **D381**. The additive reference value supplies the value 500 rpm. The value 2000 is entered in **D56**.

The additive reference value as related to **D56** supplies the result 500 rpm / 2000 rpm = ¼. This results in the total result of 1000 rpm + 1000 rpm x ¼ =1250 rpm. This value is indicated in **D382**.

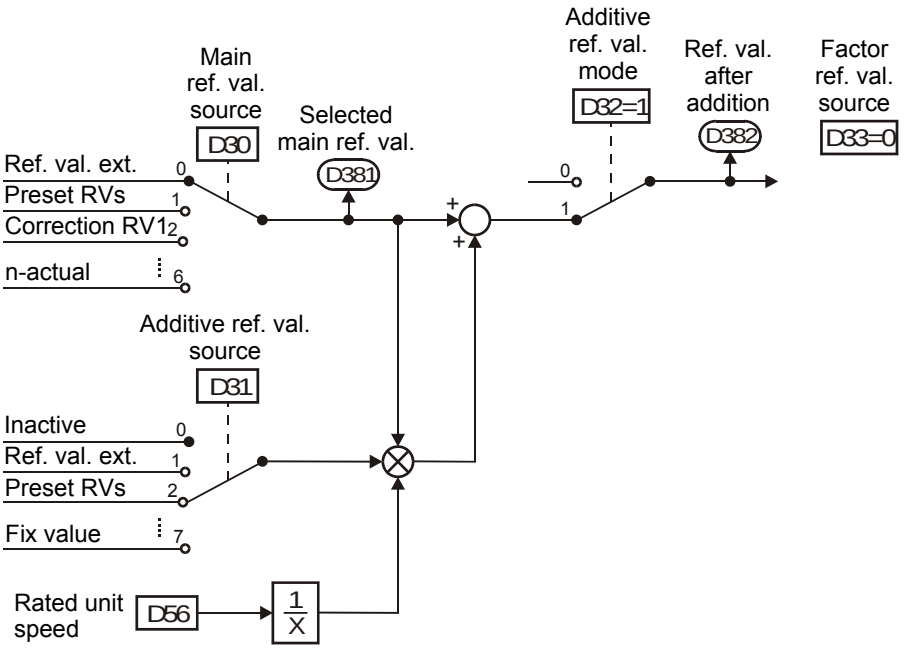

Figure 5-4 Main reference value + percental reference value

5.4 Factor Reference Value (Weighting)

Information that you will find in this section …

This section shows you how to weight one of the combinations described in chapter 5.1, 5.2, or 5.3 with a factor.

Weighting with the factor reference value

To set up weighting proceed as shown below:

- Set one of the combinations described in chap. 5.1, 5.2 or 5.3.
- Select a reference value source in **D33** (e.g., "*5:correction ref 2"*).

The reference value is related to **D56** and multiplied by the result of the addition of main reference value and additive reference value (see Figure 5-5).

Example:

The sum of main reference value and additive reference value results in the value 1500 rpm (**D382**). 3000 rpm is entered in **D56**. The reference value selected in **D33** has the value 1000 rpm.

The result is calculated as follows:

1500 rpm x 1000 rpm / 3000 rpm = 1500 rpm x 1/3 = 500 rpm

This value is indicated in **D383**.

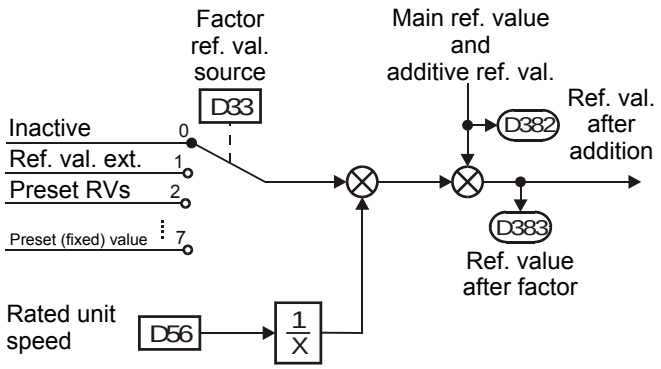

Figure 5-5 Weighting by multiplicative reference value

5.5 Switching the Main Reference Value

Information that you will find in this section …

This section shows you how to switch the main reference value selected in **D30** during operation (e.g., from reference value external to motor potentiometer).

Switching the main reference value

Use the uppermost arrow on the left side of Assistant page 4 to access the parameters to set up the switchover. This arrow takes you to page 3.8 entitled "main reference value selector" (see Figure 5-6).

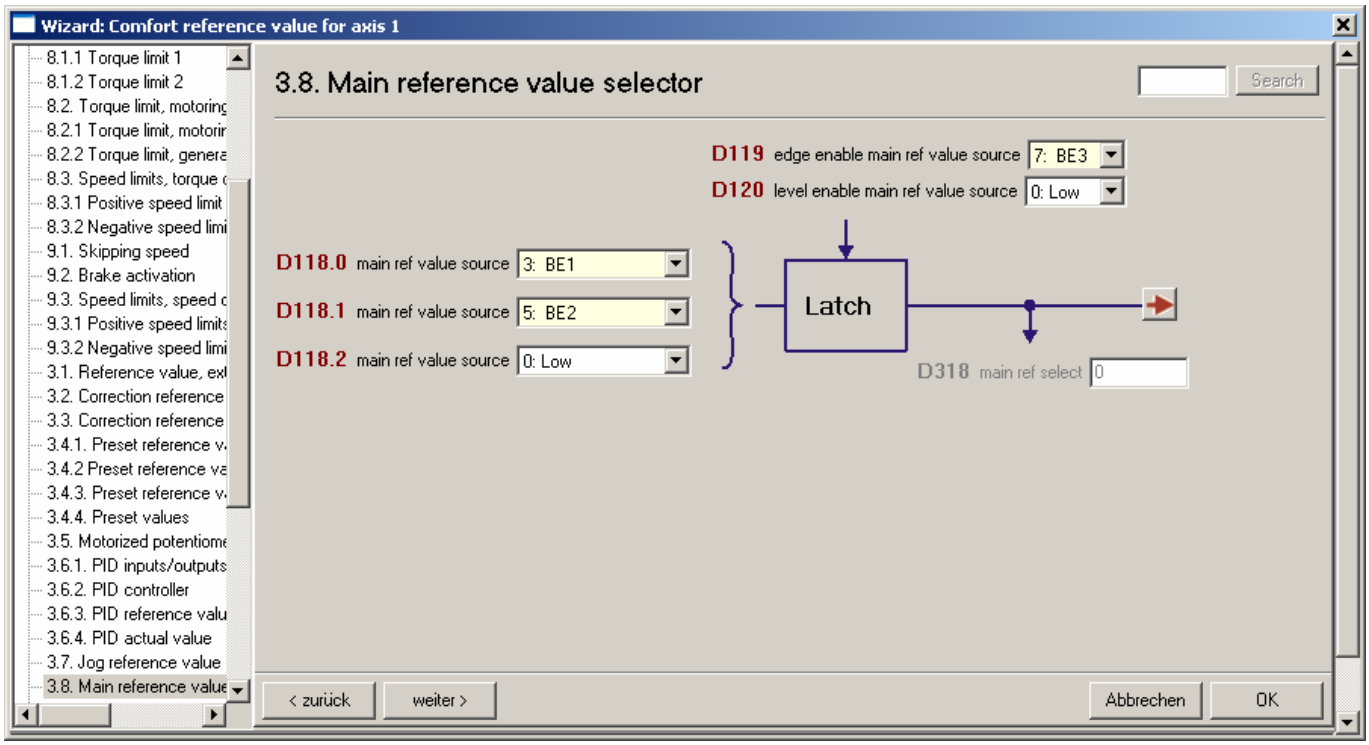
Wizard: Comfort reference value for axis 1
8.1.1 Torque limit 1
8.1.2 Torque limit 2
8.2. Torque limit, motoring
8.2.1 Torque limit, motorir
8.2.2 Torque limit, genera
8.3. Speed limits, torque
8.3.1 Positive speed limit
8.3.2 Negative speed limi
9.1. Skipping speed
9.2. Brake activation
9.3. Speed limits, speed
9.3.1 Positive speed limits
9.3.2 Negative speed limi
3.1. Reference value, ext
3.2. Correction reference
3.3. Correction reference
3.4.1. Preset reference v
3.4.2 Preset reference va
3.4.3. Preset reference v
3.4.4. Preset values
3.5. Motorized potentiome
3.6.1. PID inputs/outputs
3.6.2. PID controller
3.6.3. PID reference valu
3.6.4. PID actual value
3.7. Jog reference value
3.8. Main reference value
3.8. Main reference value selector
Search
D119 edge enable main ref value source 7: BE3
D120 level enable main ref value source 0: Low
D118.0 main ref value source 3: BE1
D118.1 main ref value source 5: BE2
D118.2 main ref value source 0: Low
Latch
D318 main ref select 0
< zurück
weiter >
Abbrechen
OK

Figure 5-6 Parameterization of the selectors for the selection of the main reference value

The signals *main ref select 0* to *2* are used for the switchover. One of the selections from **D30** is selected by the binary coding of the signals. You set the sources of these signals with selectors **D118**.0 to **D118**.2. The following table shows which signal states of the sources selected in **D118**.x can be used to achieve the respective reference values. Remember that the reference value 0 rpm is specified with selection 7.

In **D118**.2 selected source	In **D118**.2 selected source	In **D118**.2 selected source	Ref. value in **D30**
0	0	0	*0:RV external*
0	0	1	*1:Preset value*
0	1	0	*2:Correct ref1*
0	1	1	*3:Motorised pot*
1	0	0	*4:Correct ref2*
1	0	1	*5:PID*
1	1	0	*6:n-actual*
1	1	1	–

The switchover must be confirmed by an enable signal to ensure that no undesired states occur during the switchover. The enable signal can be edge or level-controlled. Select a source in **D119** for an edge-controlled signal. Set a source in **D120** for a level-controlled enable.

Binary inputs

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Main reference value select 0	The main reference value select signals can be used to switch between different main reference value sources during operation (e.g., reference value external, correction reference value or motor potentiometer). The selection with the main reference value selectors takes priority over the setting in **D30**.	**D118.0**	**D211 Bit7**	**D318**	**-**	**-**
Main reference value select 1		**D118.1**	**D211 Bit8**		**-**	**-**
Main reference value select 2		**D118.2**	**D211 Bit9**		**-**	**-**
Enable main reference value (edge)	When the main reference value is switched during operation, the change must be accepted with an enable signal. The enable can be edge or level-controlled. To accept a switchover the *enable main reference value (edge)* signal must have a positive edge or the *enable main reference value (level)* signal must have a HIGH level.	**D119**	**D211 Bit10**	**D319**	**D419.0**	**D419.1**
Enable main reference value (level)		**D120**	**D211 Bit11**	**D320**	**D420.0**	**D420.1**

6 AVAILABLE REFERENCE VALUES

Information that you will find in this chapter ...

This chapter gives you information on:

- the functions of the reference values that you can set as main reference value, additive reference value and weighting factor
- when to use them
- and how to parameterize the functions.

To access the reference values, call the applicable page of the Assistant or go to page 4 and use the arrow keys to the left of parameters **D30**, **D31** and **D33**.

6.1 Reference Value External, Correction Reference Value 1 and 2

Information that you will find in this section ...

This section shows you:

- the conditions under which to use the reference values "reference value external, correction reference value 1, and correction reference value 2"
- how the reference values are set up
- and how to parameterize the reference values.

When to use the reference values …

Use the reference values if you want to constantly change the reference values (e.g., via a potentiometer or via the analog output group of a PLC). The reference value can also be transferred via fieldbus.

Structure

Figure 6-1 shows the structure of the functions "reference value external, and correction reference values 1 and 2." The table at the end of the section lists the related parameters for each reference value.

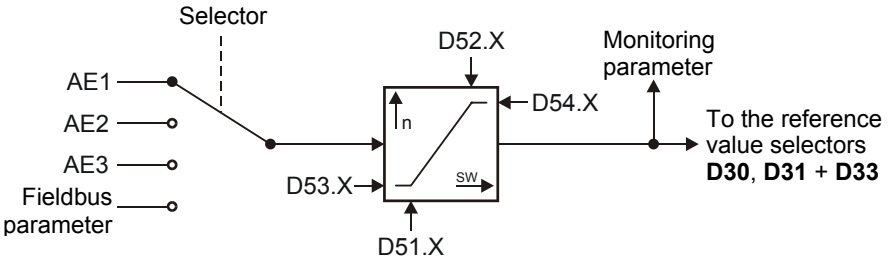

Figure 6-1 Structure of reference value external and correction reference values

How to parameterize the reference values ...

To parameterize a reference value, proceed as shown below:

- The source of the reference value signal can be set in the selector. You can supply the reference value external and the correction reference values 1 and 2 via fieldbus or analog input. Figure 6-2 shows page 3.1 of the Assistant for scaling the reference value external. In our example analog input 1 (AE1) is set in **D132** as the interface. All parameters which you can use to modify the analog signal are listed. With fieldbus the selection *4:parameter* is made in the selector. The reference value is written via fieldbus to the fieldbus parameter.

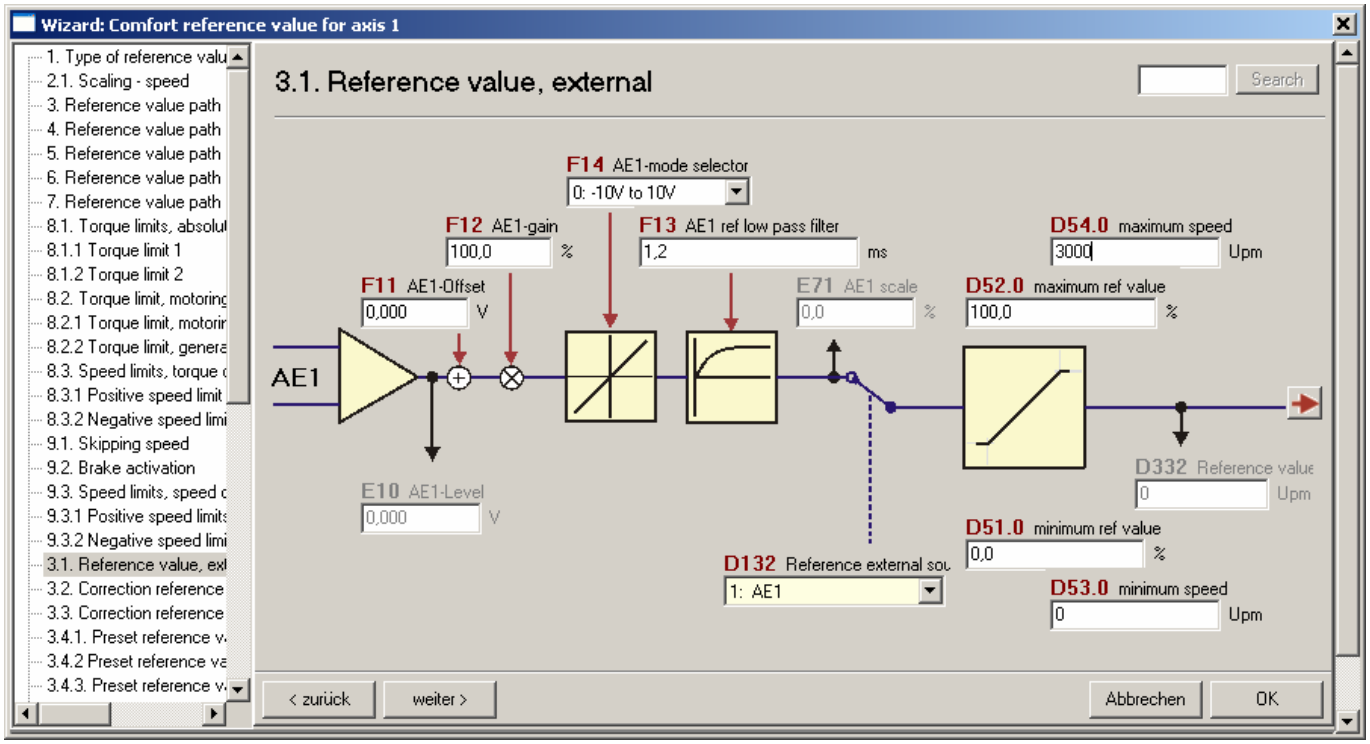

Figure 6-2 Parameterization of the signal source for reference value external

Characteristic curve scaling

- Use the array parameters **D51**.X to **D54**.X to scale the characteristic curve. The characteristic curve links the selected input area with the set reference value area in user units.
  Example of reference value external:
  D51.0 = 0.5 V, **D52**.0 = 8 V
  D53.0 = 100 Rpm, **D54**.0 = 1500 Rpm
  This setting means that 100 Rpm is specified when the reference value is 0.5 V and 1500 Rpm is specified when the reference value is 8 V. The characteristic curve is calculated linearly between these two points.
- The ramps for the reference values can be parameterized in **D82** and **D83**. You can set the ramps on page 4 of the Assistant.

In online mode you can view the current value of the reference value regardless of the source set in the monitoring parameter.

Analog signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Scaling
Reference value external	Analog reference value signals	**D132**	**D232**	**D332**	**D51.0 to D54.0**
Correction reference value 1		**D133**	**D233**	**D333**	**D51.1 to D54.1**
Correction reference value 2		**D134**	**D234**	**D334**	**D51.2 to D54.2**

6.2 Preset Values (Fixed Values) and Preset Reference Values

Information that you will find in this section …

This section shows you:

- what preset reference values and preset values are
- the conditions under which preset reference values and preset values can be used
- how to define preset reference values and preset values
- and how to address preset reference values and preset values.

Description

When a preset reference value or a preset value is used a fixed value is output. The speed is changed by switching between different preset values.

A ramp block can be set for a preset reference value. In contrast to the preset reference value a preset value has no ramps. This is why the preset value can only be used as an additive and factor reference value.

Up to 16 preset reference values and 8 preset values are available. Selection is binary-coded via binary inputs or bits in a control word (via fieldbus).

When you select the preset reference values via binary inputs 16 preset reference values and 8 preset values are available. When fieldbus is used eight preset reference values and eight preset values can be accessed at the same time. If you don't use preset values via fieldbus, 16 preset reference values are also accessible.

When to use preset reference values and preset values …

Preset reference values and preset values are used when you need to switch between a maximum of 16 reference values which do not change. An example is the 3-stage setting of a pump.

6.2.1 Preset Reference Values

Preset reference values

Preset reference values and ramp blocks are entered on page 3.4.1 of the Assistant (Figure 6-3). Selection via binary signals is parameterized on page 3.4.2. Display Parameters are available on page 3.4.3 for online monitoring.

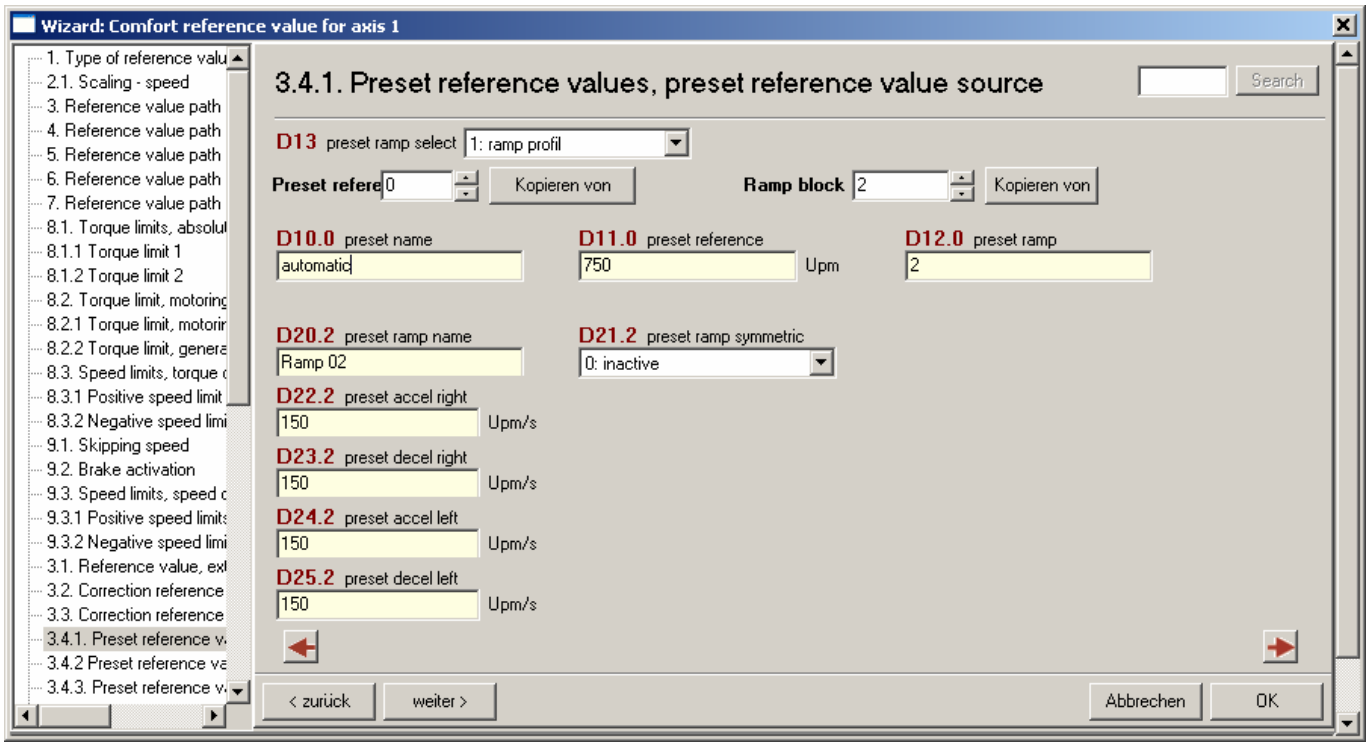

Figure 6-3 Parameterization of the preset reference values

How to enter preset reference values …

Preset reference values are entered on page 3.4.1 (Figure 6-4). Proceed as follows:

- Use the up/down arrow keys to select the preset reference value which you want to enter.
- Enter the designation of the preset reference value (e.g., feed) in parameter **D10**.x.
- Enter the value of the preset value (e.g., 100 [rpm] in **D11**.x.
- Select the next preset reference value and keep repeating the procedure until you have defined all necessary preset reference values.

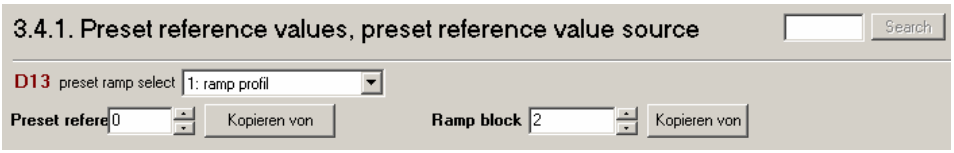

Figure 6-4 Setting a preset reference value

How to parameterize the selection of the preset reference values …

To parameterize the preset value selection proceed as shown below (Figure 6-5):

- Go to page 3.4.2 of the Assistant.
- Set the sources of your switchover signals (e.g., BE1 to BE3) in **D124**.0 to **D124**.2. Select the setting *2: parameter* for fieldbus mode. Bits 0 to 3 of control word **D212** are used as sources for fieldbus mode.
- Set the enable of the switchover in **D128** or **D129**. The enable is necessary to prevent any undesired states from occurring during the switchover. You can activate the enable with a positive edge (**D128**) or a high level (**D129**). If the switchover is to take effect immediately set **D129** = *1:High*.

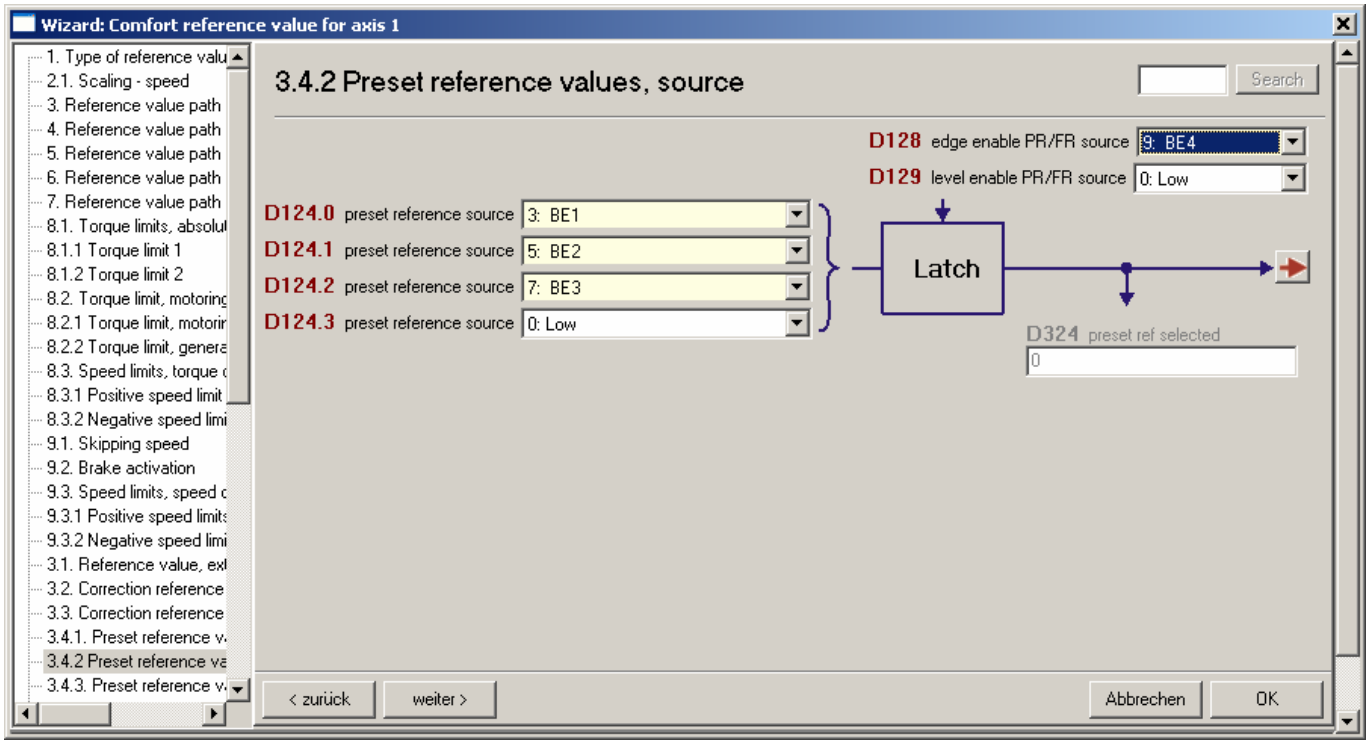

Figure 6-5 Parameterization of the preset reference value selectors

Example

Eight preset reference values are to be used. The binary inputs BE1, BE2 and BE3 are to be used as sources for the "preset reference source" signals 0 to 2. The array parameters **D124**.X are set to:

- **D124**.0 = 3:BE1
- **D124**.1 = 5:BE2
- **D124**.2 = 7:BE3

The preset reference value 6 is selected (110 binary=6 dec) with the signal state of:

BE3	BE2	BE1
1	1	0

The value in **D11**.6 is the preset reference value.

How to link preset reference values and ramps …

There are several ways to link the 16 preset reference values with the 16 ramp blocks. You can select one of the methods in parameter **D13** on page 3.4.1 of the Assistant (Figure 6-6).

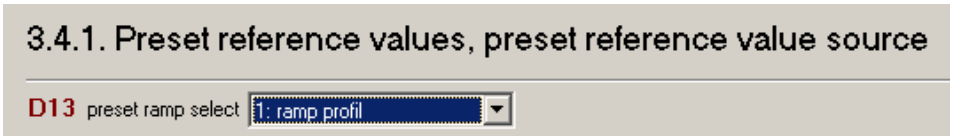

Figure 6-6 Link of preset reference values and ramps

- **D13** = *0:preset value*
  Preset reference values and ramp profiles of the same parameter element are coupled with the setting "*0:preset value.*" This means that preset reference value 0 (**D10**.0, **D11**.0) is used with the settings of ramp profile 0 (**D20**.0 to **D25**.0), preset reference value 1 (**D10**.1, **D11**.1) with ramp profile 1 (**D20**.1 to **D25**.1), and so on.
- **D13** = *1:ramp profile*
  This setting allows you to enter the number of a ramp profile in parameter **D12**.X for the coupling of preset reference value and ramp profile.
  Example: **D12**.3 = 0 means that preset reference value 3 (**D11**.3) is used with ramp profile 0. This setting makes it possible to configure several preset reference values with one ramp profile.
- **D13**= *2:binary signals*
  Deceleration and acceleration ramps are assigned to the preset reference value independently of each other with this setting. Parameter **D21**.x has no function so that you cannot set a symmetric ramp for direction to the right and direction to the left. Allocation is binary-coded. The signal sources are selected with selectors **D126**.X for accelerations and **D127**.X deceleration ramps. Binary inputs or a fieldbus parameter can be selected. When fieldbus is used the signal source is provided by parameter **D210** with bit 4 to bit 7 for accelerations and bit 8 to bit 11 for deceleration ramps. Figure 6-7 shows the relationship for the acceleration ramps. To keep things simple an example is shown in which a choice of four acceleration ramps is available.
  The signal sources for the preset reference value accelerating source select 0 and preset reference value accelerating source select 1 are set in parameters **D126**.0 and **D126**.1. These signals are used for the binary-coded selection of one of the ramp profiles 0 to 3. The parameters **D22**.X and **D24**.X are important for the selection of the accelerations in the ramp profile. Depending on the current direction of rotation **D22**.X is used for direction to the right and **D24**.X for direction to the left.

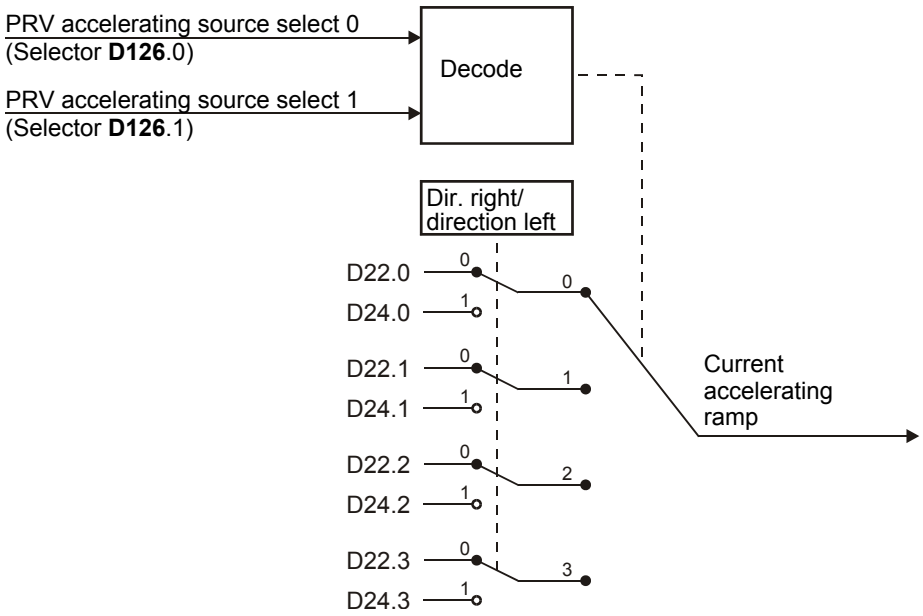

Figure 6-7 Ramp selection in mode **D13** = 2: binary signal

How to enter ramp blocks …

Enter the ramps on page 3.4.1 as shown below (Figure 6-8):

- Go to page 3.4.1 of the Assistant.
- Use the up/down arrow keys to select the ramp block that you want to enter.
- Enter the designation of the ramp block (e.g., ramp feed) in parameter **D20**.x. Enter in **D21**.x whether you want symmetric or asymmetric ramps for right or left direction. When **D21**.X is set to *1:active* the acceleration ramp is specified in **D22**.x and the deceleration ramp is specified in **D23**.x for both directions of rotation. When **D21**.x=*0:inactive*, **D22**.x and **D23**.x apply to the right direction. **D24**.x and **D25**.x provide the ramps for acceleration and deceleration for the left direction.
- Enter the ramp values (e.g., 150 [rpm/s]) in **D22**.x to **D25**.x.

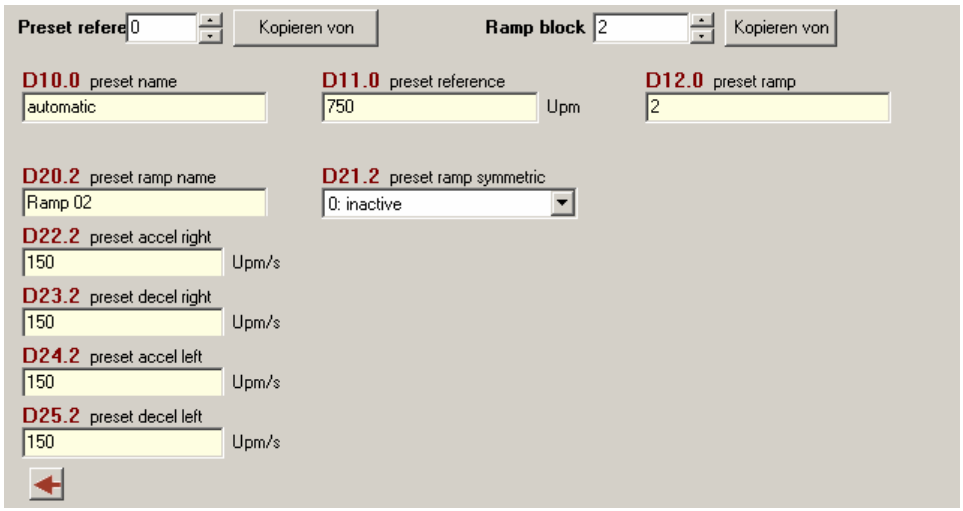

Figure 6-8 View of the ramp profile Assistant

Switching of preset reference values and ramp blocks

An enable function can be used to catch undesired states when the preset values and the preset reference values and ramp profiles are switched. The enable is edge or level-controlled.
When an edge-controlled enable is selected, a signal source (e.g., BE2) is selected in **D128**. The enable takes effect when this source supplies a positive edge. A binary input or a parameter for fieldbus mode can be selected in **D128** (fieldbus mode **D212**, bit14).
When a level-controlled enable is selected the switchover is accepted when the signal selected in **D129** is high. The same signal sources can be selected in **D129** as in **D128**. **D212** bit 15 is used as the signal source for fieldbus mode.
The enables are OR-linked (i.e., either the level-controlled or edge-controlled enable must be activated before a switchover is accepted). They enable the switched preset values, preset reference values, and ramp profiles simultaneously.

Details on the decelerating ramps

To prevent preset reference values with high speeds from being decelerated with too short ramps during switchover procedures, activation of the decelerating ramps is dependent on **D13**

- **D13** = *0:preset value* and **D13** = *1:ramp profile*
  The decelerating ramp of the new preset reference value becomes active when the new preset reference value is reached.
  Example: The motor revolves at the current preset reference value of 3000 rpm and the decelerating ramp of 100 rpm/s. A switchover is made to the preset reference value of 75 rpm with the decelerating ramp of 750 rpm/s.
  After the enable of the switchover is given the drive decelerates with 100 rpm/s to 75 rpm. When the drive reaches this speed, the decelerating ramp of 750 rpm/s becomes active.
- **D13** = *2:binary signals*
  The decelerating ramp becomes active immediately after a switch since the user can switch between decelerating and accelerating ramps with this setting.

Binary input signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Preset reference value select 0	Binary-coded switching between the preset reference values is performed with the signals *preset reference value select 0* to *3*.	**D124.0**	**D212 Bit0**	**D324**	-	-
Preset reference value select 1		**D124.1**	**D212 Bit1**		-	-
Preset reference value select 2		**D124.2**	**D212 Bit2**		-	-
Preset reference value select 3		**D124.3**	**D212 Bit3**[1]		-	-
Preset reference value accelerating ramp select 0	When **D13** is set to *2:binary signals*, the signals *accelerating ramp select 0* to *3* are used to select the accelerating ramp.	**D126.0**	**D212 Bit6**	**D326**	-	-
Preset reference value accelerating ramp select 1		**D126.1**	**D212 Bit7**		-	-
Preset reference value accelerating ramp select 2		**D126.2**	**D212 Bit8**		-	-
Preset reference value accelerating ramp select 3		**D126.3**	**D212 Bit9**		-	-
Preset reference value decelerating ramp select 0	When the parameter **D13** is set to *2:binary signals*, the signals *decelerating ramp select 0* to *3* are used to select the decelerating ramp.	**D127.0**	**D212 Bit10**	**D327**	-	-
Preset reference value decelerating ramp select 1		**D127.1**	**D212 Bit11**		-	-
Preset reference value decelerating ramp select 2		**D127.2**	**D212 Bit12**		-	-
Preset reference value decelerating ramp select 3		**D127.3**	**D212 Bit13**		-	-

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Enable preset reference value / preset value (edge)	After a switchover of the preset reference values, preset values, and accelerating and decelerating ramps, the change must be accepted with an enable signal. This prevents undesired states. The enable is given when there is a positive edge with the signal *enable preset reference value/preset value (edge)* or a HIGH level with the signal *enable preset reference value/preset value (level)*.	**D128**	**D212 Bit14**	**D328**	**D428.0**	**D428.1**
Enable preset reference value / preset value (level)		**D129**	**D212 Bit15**	**D329**	**D429.0**	**D429.1**

[1] **D212** bit 3 has a double allocation. When both preset reference values and preset values are addressed via fieldbus, this bit is evaluated as *preset value select 0*. This means that eight preset reference values and eight preset values can be selected at the same time. If no preset values are addressed via fieldbus (i.e., they are addressed via terminals or are not used at all), **D212** bit 3 is evaluated as *preset reference value select 3* and 16 preset reference values can be addressed.

6.2.2 Preset Values

Preset values

The preset values are parameterized on page 3.4.4 of the Assistant (Figure 6-9). The upper part of this page contains the parameterization of the preset value selection. The middle section covers the entry of the preset values, and the bottom part concerns the display parameters for monitoring the current preset value.

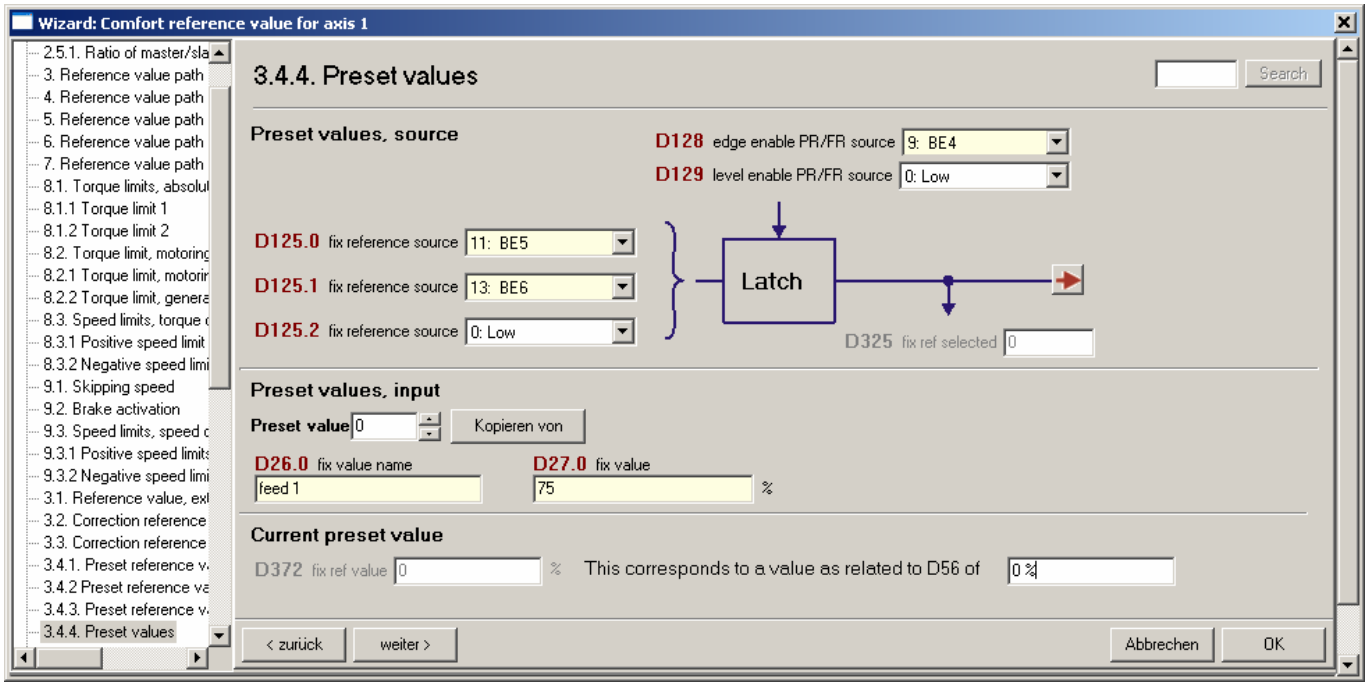

Figure 6-9 Parameterizing the preset values

How to parameterize the selection of the preset values …

To parameterize the selection of the preset values, proceed as shown below (Figure 6-10):

- Set the sources of your switchover signals (e.g., BE5 and BE6) in **D125**.0 and **D125**.1. With fieldbus select the setting *2: parameter*. In fieldbus mode bits 3 to 5 of the control word **D212** are used as sources.
- Set the enable of the switchover in **D128** or **D129**. The use of an enable prevents undesired states from occurring. The enable can be given with a positive edge (**D128**) or a high level (**D129**). If the switchover is to take effect immediately, set **D129** = *1:high*.
- Check the selection in **D325** during online operation of POSITool.

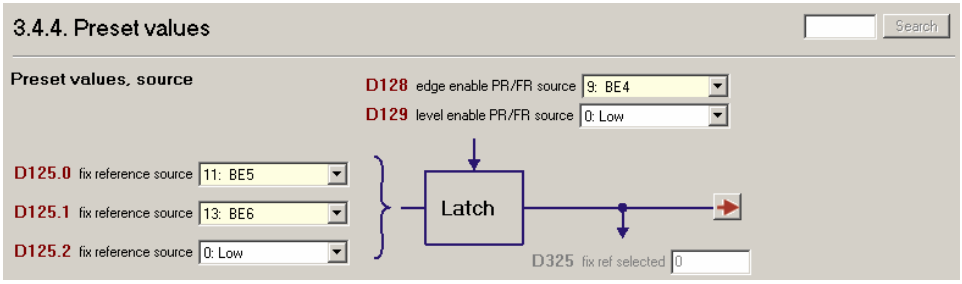
3.4.4. Preset values
Search
Preset values, source
D128 edge enable PR/FR source 9: BE4
D129 level enable PR/FR source 0: Low
D125.0 fix reference source 11: BE5
D125.1 fix reference source 13: BE6
D125.2 fix reference source 0: Low
Latch
D325 fix ref selected 0

Figure 6-10 Parameterizing the preset value selectors

NOTE

Remember that the signals set in **D128** and **D129** also enable the switchover of the preset reference values. For more information, see chapter 6.2.2.

How to define preset values …

Preset values are entered in the middle section of page 3.4.4 as described below (Figure 6-11):

- Use the up/down arrow keys to select the preset value which you want to enter.
- Enter the designation of the preset value (fix value name) (e.g., feed) in the parameter **D26**.x.
- Enter the value of the preset value (fix value) (e.g., 100 [rpm]) in **D27**.x.
- Select the next preset value and keep repeating the procedure until you have defined all necessary preset values.

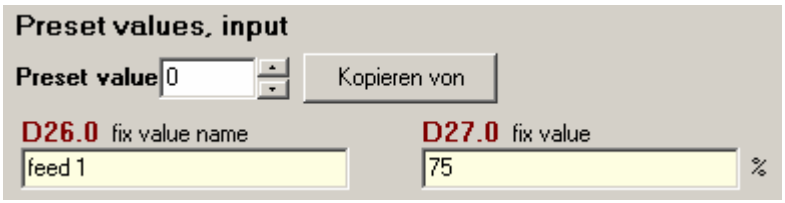

Figure 6-11 Entering preset value 0

How to monitor preset values …

After you have transferred your parameterization at the end and an active online connection has been established between POSITool and the inverter, you can check your settings in the bottom half of the screen.

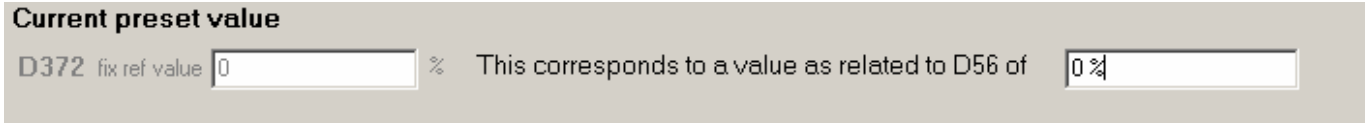

Figure 6-12 Monitoring a preset value

Binary input signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Preset value select 0	The binary-coded switchover between the preset values takes place with the preset value select signals 0 to 2.	**D125**.0	**D212** Bit3	**D325**	-	-
Preset value select 1		**D125**.1	**D212** Bit4		-	-
Preset value select 2		**D125**.2	**D212** Bit5		-	-

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Enable preset reference value / preset value (edge)	After a switchover of the preset reference values, preset values, acceleration and deceleration ramps, the change must be accepted by an enable signal. This prevents undesired states. The enable is given when the *enable preset reference value/preset value (edge)* signal has a positive edge or the *enable preset reference value/preset value (level)* signal has a HIGH level.	**D128**	**D212 Bit14**	**D328**	**D428.0**	**D428.1**
Enable preset reference value / preset value (level)		**D129**	**D212 Bit15**	**D329**	**D429.0**	**D429.1**

6.3 Motor Potentiometer

Information that you will find in this section …

This section gives you information on:

- when to use the motor potentiometer
- how the motor potentiometer reference value works
- and how to set the reference value

When to use the motor potentiometer …

Use the motor potentiometer when you want to make a digital change in a reference value. This means that you raise or lower the reference value via binary signals.

Remember that the motor potentiometer reference value is secure against power failures. This means that the last valid value is still present after power off and power on unless a reset has been parameterized for power on (**D40** bit 0 – for details see next section).

All the settings for the motor potentiometer are made on page 3.5 of the Assistant (Figure 6-13).

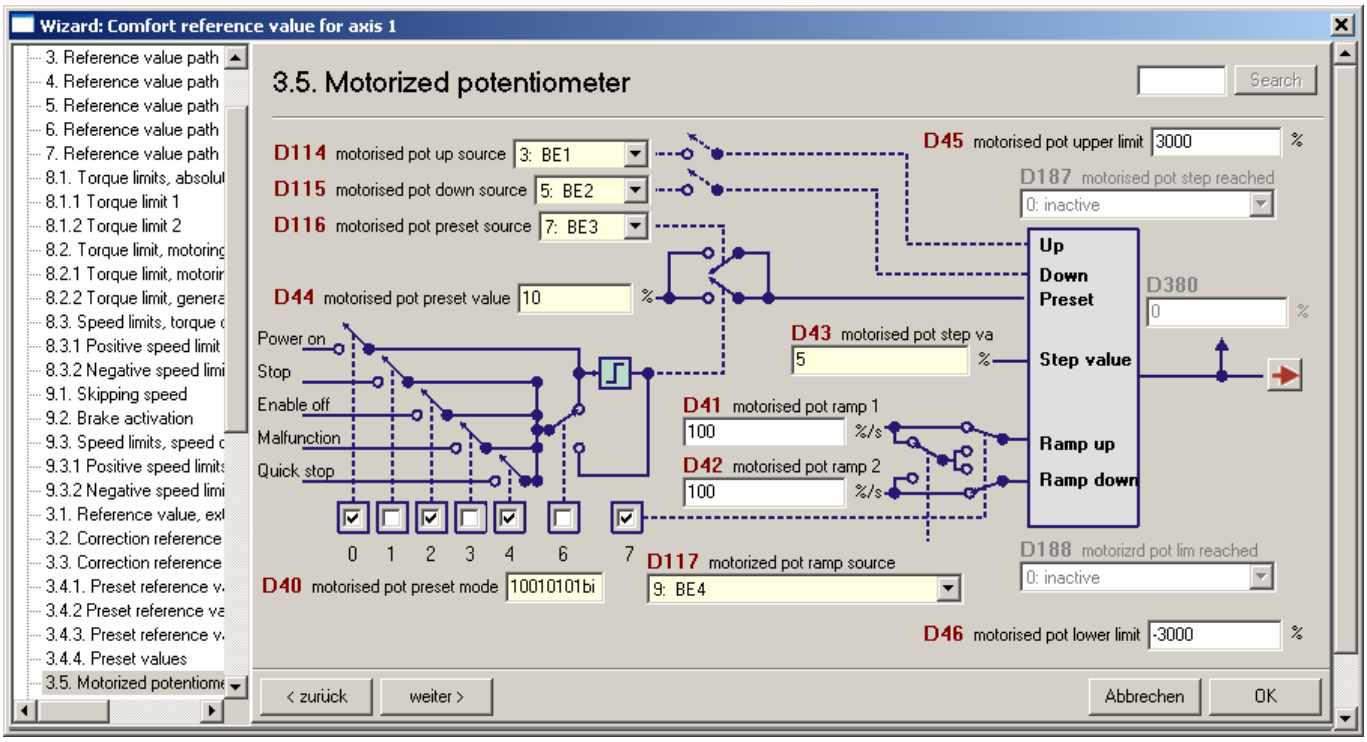

Figure 6-13 Making the settings for the motor potentiometer

How to parameterize the motor potentiometer …

Parameterize the motor potentiometer as shown below. Use Figure 6-14 as a guide:

- Set the sources for the signals motorized pot UP and motorized pot DOWN in **D114** and **D115**. These signals are used to raise or lower the reference value.
- In **D43** enter how the change is to be made. If the value 0 is entered in **D43**, the motorized pot reference value is raised or lowered with the ramp from **D41** or **D42** as long as the applicable binary signal is active (motorized pot UP, motorized pot DOWN, Figure 6-14 ❶, ❸). When both signals are active, no change is made in the reference value (Figure 6-14 ❷).
  If you enter a value other than 0 in **D43**, the reference value is raised or lowered by the value entered in **D43** with each rising edge on the digital inputs (Figure 6-14 Step, ❹,❺,❻). This adjustment uses the ramp entered in **D41** or **D42**. A new change in step is not executed until the previous step is concluded (Figure 6-14 ❻).
- The ramps of the motorized pot reference value are parameterized in **D41** and **D42**.

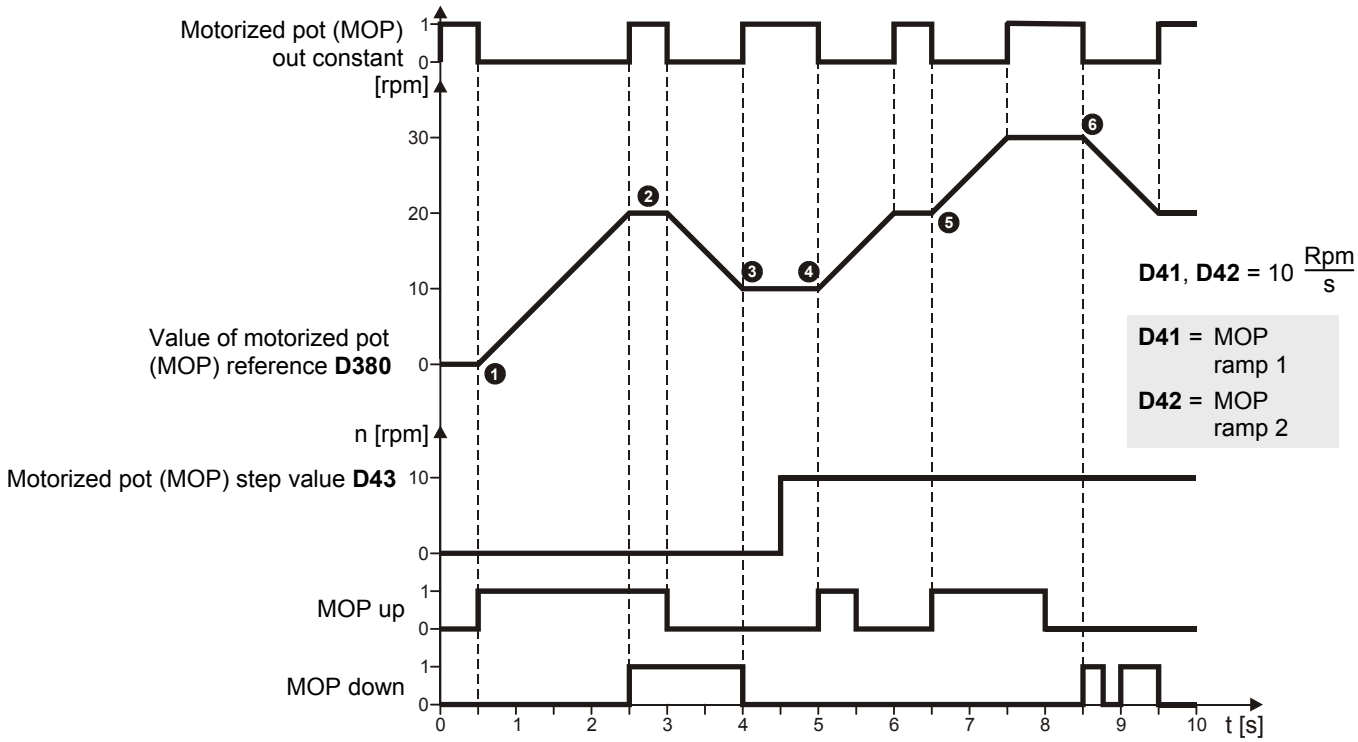

Figure 6-14 Reference value change with motor potentiometer

Motor potentiometer ramps

There are two ways to use the ramps of the motor potentiometer reference value based on the parameter **D40** bit7.

- When bit 0 is inactive, **D41** is used as the acceleration ramp and **D42** as the deceleration ramp.
- When bit 0 is active, a switch is made between **D41** and **D42** with a binary signal (signal source set in **D117**). In this case **D41** and **D42** apply to both acceleration and deceleration.
  This makes it possible to approach the range of the motor potentiometer reference value with a fast ramp. After the switch to the second, lower ramp the motor potentiometer reference value can be adjusted.

Limitation

When the reference value reaches the values in **D45** motorized pot upper limit or **D46** motorized pot lower limit, a limitation takes effect (Figure 6-15 ❶,❹). The limits cannot be exceeded or passed below. When the reference value leaves the limit area, the change takes effect immediately (Figure 6-15 ❷).

When **D40** bit 5 is activated the signals MOP up and MOP down are disabled when the torque limits are reached. The parameters **E180** and **E181** determine when the torque limits are reached.

The signals MOP up and MOP down are also disabled when a stop or a quick stop is executed and when the freeze condition is active (**A576** control word bit 6) when DSP402 device control is being used.

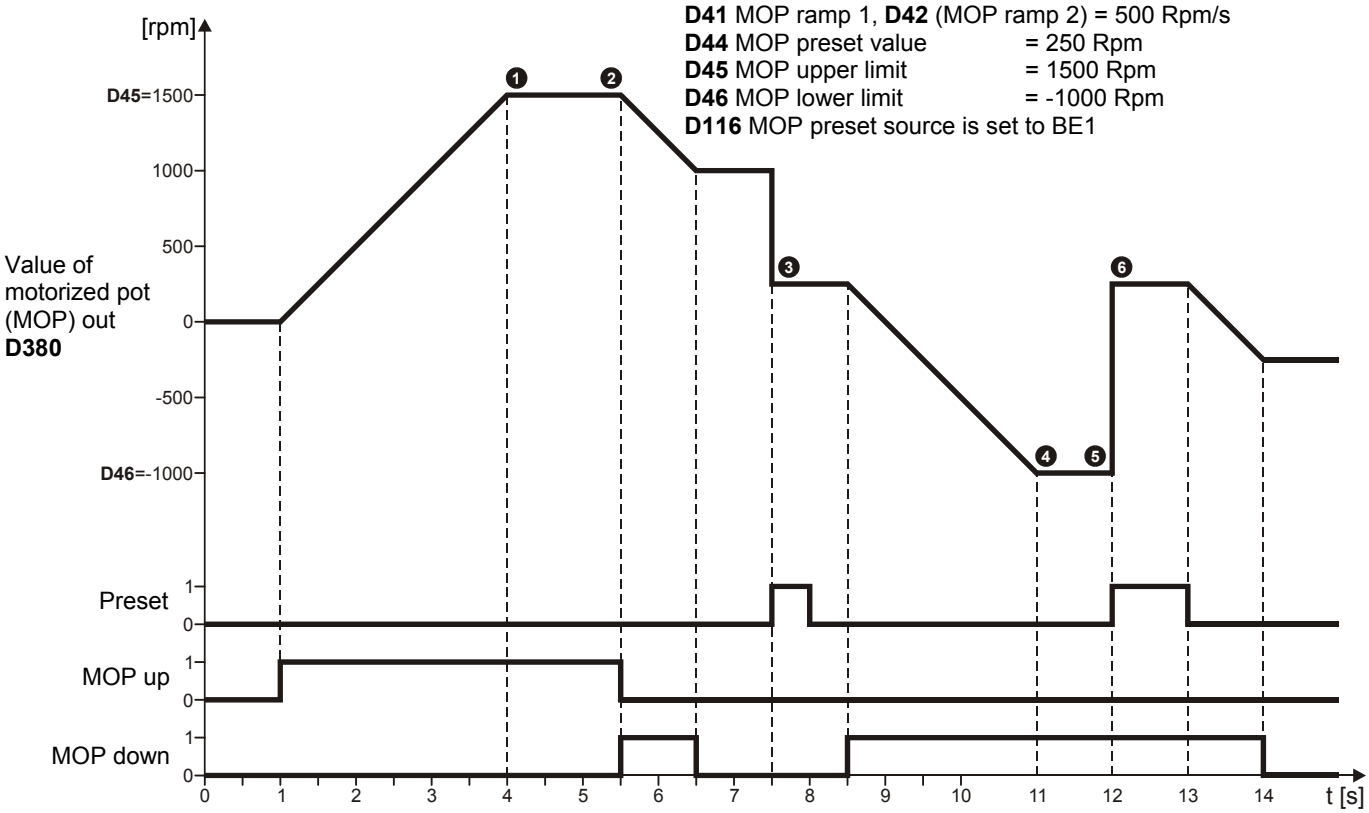
D41 MOP ramp 1, **D42** (MOP ramp 2) = 500 Rpm/s
D44 MOP preset value = 250 Rpm
D45 MOP upper limit = 1500 Rpm
D46 MOP lower limit = -1000 Rpm
D116 MOP preset source is set to BE1
[rpm]
D45=1500
1000
500
0
-500
D46=-1000
Value of motorized pot (MOP) out **D380**
Preset
MOP up
MOP down
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 t [s]
❶ ❷ ❸ ❹ ❺ ❻

Figure 6-15 Limitation of the motor potentiometer and reset of the reference value

How to reset the reference value …

You can reset the current reference value to a certain value with signals or events (Figure 6-15 ❸,❺). Enter the value in **D44** MOP PreValue. A reset can be triggered in the following ways:

- Set a source in **D116** which provides a binary signal. A high-level signal causes a reset to take place.
- You can activate appropriate bits in parameter **D40** so that a reset takes place when one of the following events occurs.

Reset for	By Activation of
Power ON	**D40** Bit 0
Stop	**D40** Bit 1
Enable OFF	**D40** Bit 2
Malfunction	**D40** Bit 3
Quick stop	**D40** Bit 4

- In bit 6 of **D40** select whether the evaluation of the reset events is to be level or edge-triggered. When the bit is inactive the reset is triggered by a positive edge. When the bit is active the reset is active at a high level.

If several reset conditions are active at the same time the events are OR-linked (i.e., at least one event must occur before the motor potentiometer reference value is reset).

A reset signal takes priority over the MOP up and MOP down signals (Figure 6-16 ❻). With level-triggered evaluation MOP up and MOP down do not take effect as long as the reset signal is high.

When a limit switch is triggered or a direction of rotation is inhibited (for a description, see chap. 7) the motor potentiometer reference value is reset to the value 0.

The settings are made in **D116** and **D40** on page 3.5 of the Assistant. The bits are activated with the check boxes (Figure 6-16).

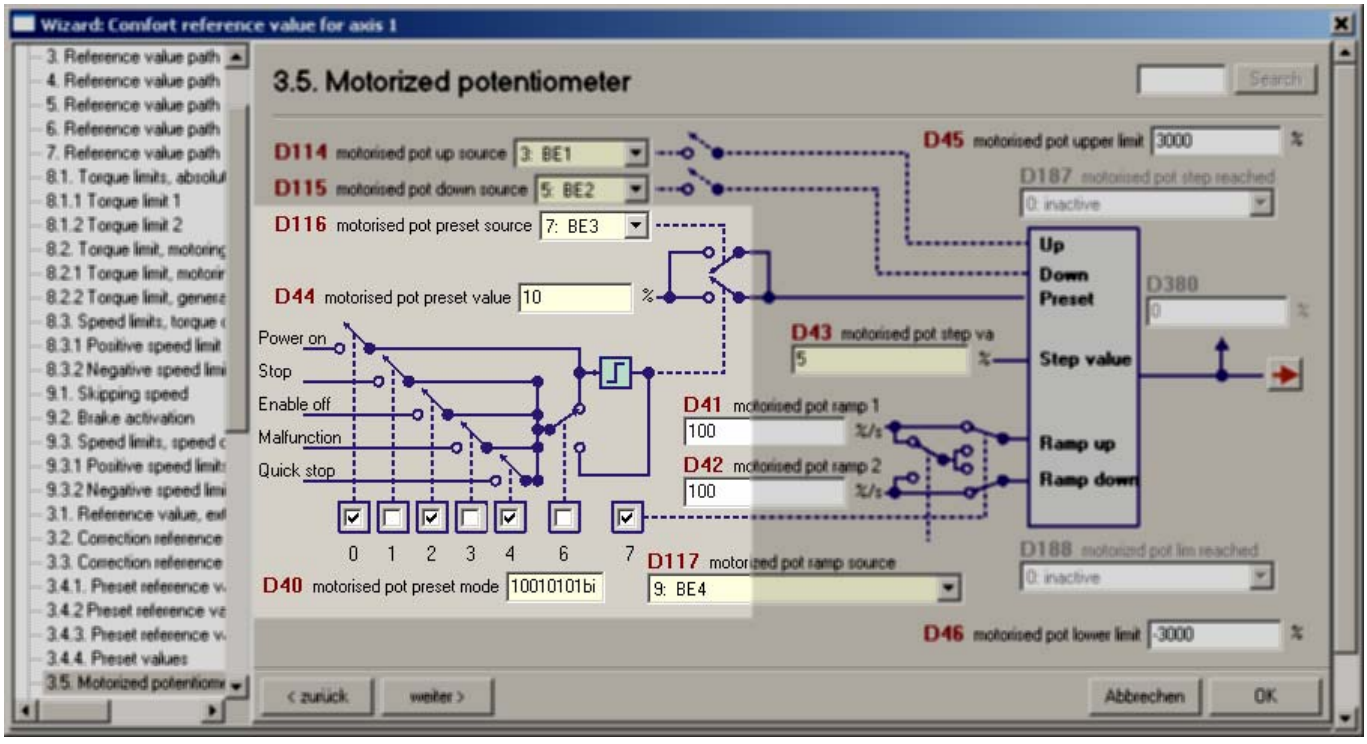

Figure 6-16 Setting the reset conditions

Binary input signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Motorized pot up source	A high level increases the motor potentiometer reference value in steps or continuously, depending on **D43**.	**D114**	**D211 Bit0**	**D314**	**-**	**-**
Motorized pot down source	A high level decreases the motor potentiometer reference value in steps or continuously, depending on **D43**.	**D115**	**D211 Bit1**	**D315**	**-**	**-**
Motorized pot preset source	A high level sets the current motor potentiometer reference value to the value entered in **D44**.	**D116**	**D211 Bit2**	**D316**	**D416.0**	**D416.1**
Motorized pot ramp selection	When **D40 b**it 7 is active the signal *motorized pot ramp source* can be used to switch between **D41** and **D42**. **D41** is used for low level. The ramp **D42** is used for high level.	**D117**	**D211 Bit3**	**D317**	**D417.0**	**D417.1**

Status signals

Signal	Function	Fieldbus Image	Single Parameter
Motorized pot out constant	Signal indication depends on **D43**. When the value 0 is entered in **D43** the motor potentiometer (MOP) reference value is changed continuously. Signal 1 is active when the signals MOP up and MOP down are simultaneously inactive or simultaneously active. When **D43** is a value other than 0, reference values are changed in steps. The signal is 1:active when a step is completed and becomes 0:inactive when a new step is started.	**D200 Bit13**	**D187**
Motorized pot limit reached	A high level means that the motor potentiometer reference value has reached the value in **D45** or **D46**.	**D200 Bit14**	**D188**

6.4 PID Controller

Information that you will find in this section …

This section gives you information on:

- when to use the PID controller
- how the PID controller is set up
- and how to set the PID controller

When to use the PID controller …

The PID controller is used to calibrate reference values and actual values via a PID structure (control). You can use this to implement tension, pressure, or filling level control, for instance.

Structure of the PID controller

The PID controller must be supplied with a reference value and an actual value (Figure 6-17). A control error is calculated from reference value and actual value which is then applied to the PID controller (Figure 6-22). You can select and use the result of the PID structure in **D30**, **D31,** or **D33**.

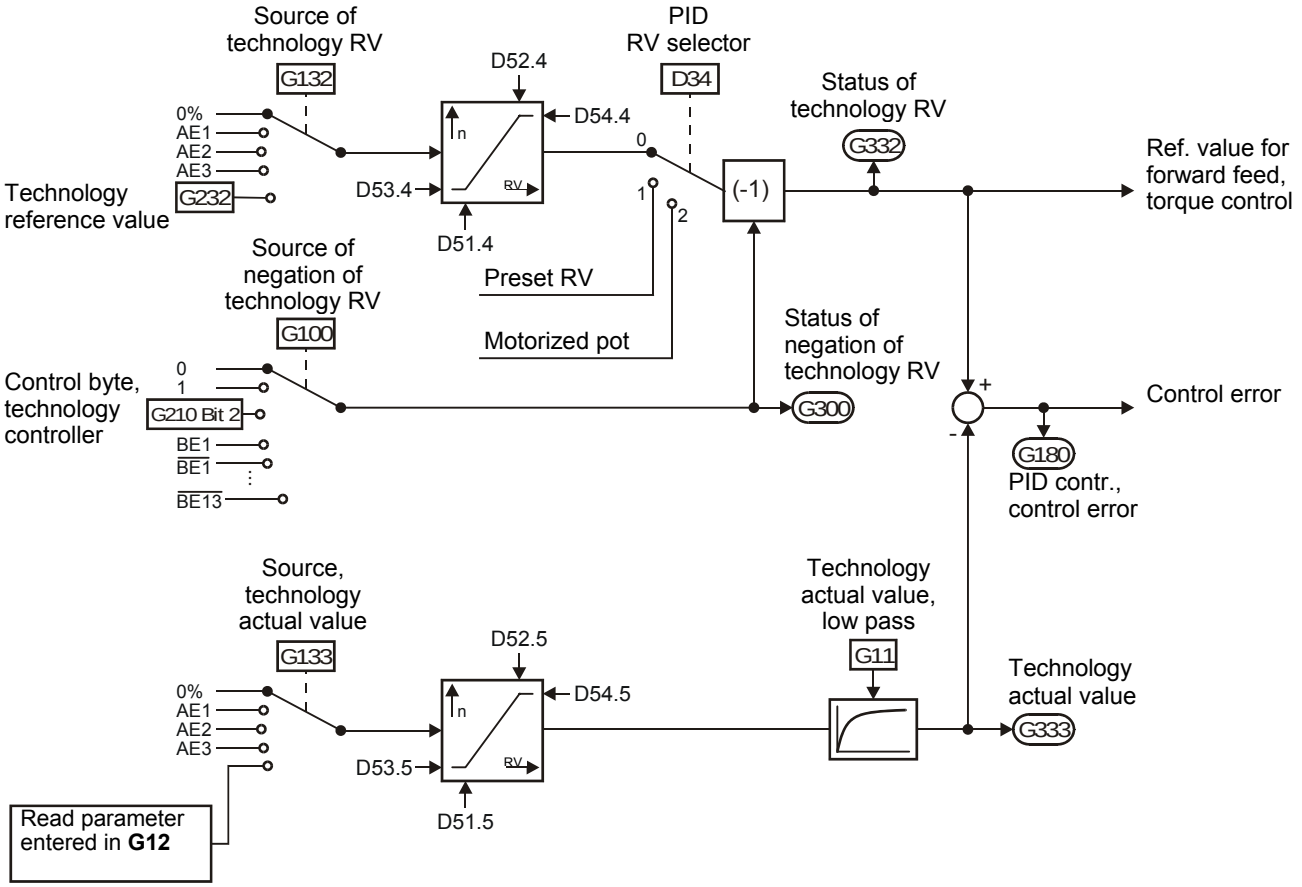

Figure 6-17 PID controller: Reference value-actual value comparison

How to parameterize the reference value of the controller …

Parameterization is performed on page 3.6.1 of the Comfort Reference Value Assistant. Proceed as shown below:

- In **D34** select whether you want to supply the PID reference value with an analog signal, preset reference values, or the motor potentiometer.

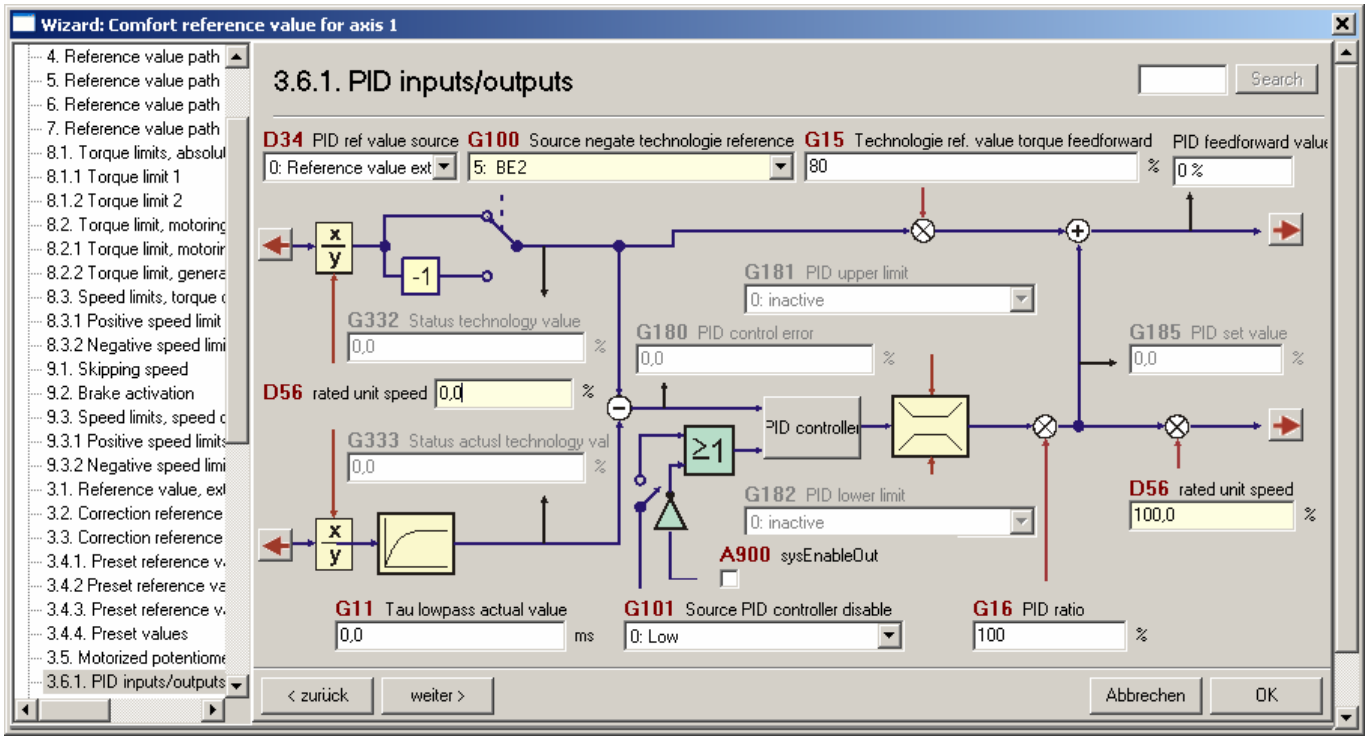

Figure 6-18 Setting the source for the PID reference value

- If you selected preset reference value or motor potentiometer set the reference values as shown in chapters 6.2 and 6.3.
- If you set **D34** = *0:Reference value extern* go to page 3.6.3 of the Assistant (Figure 6-19).

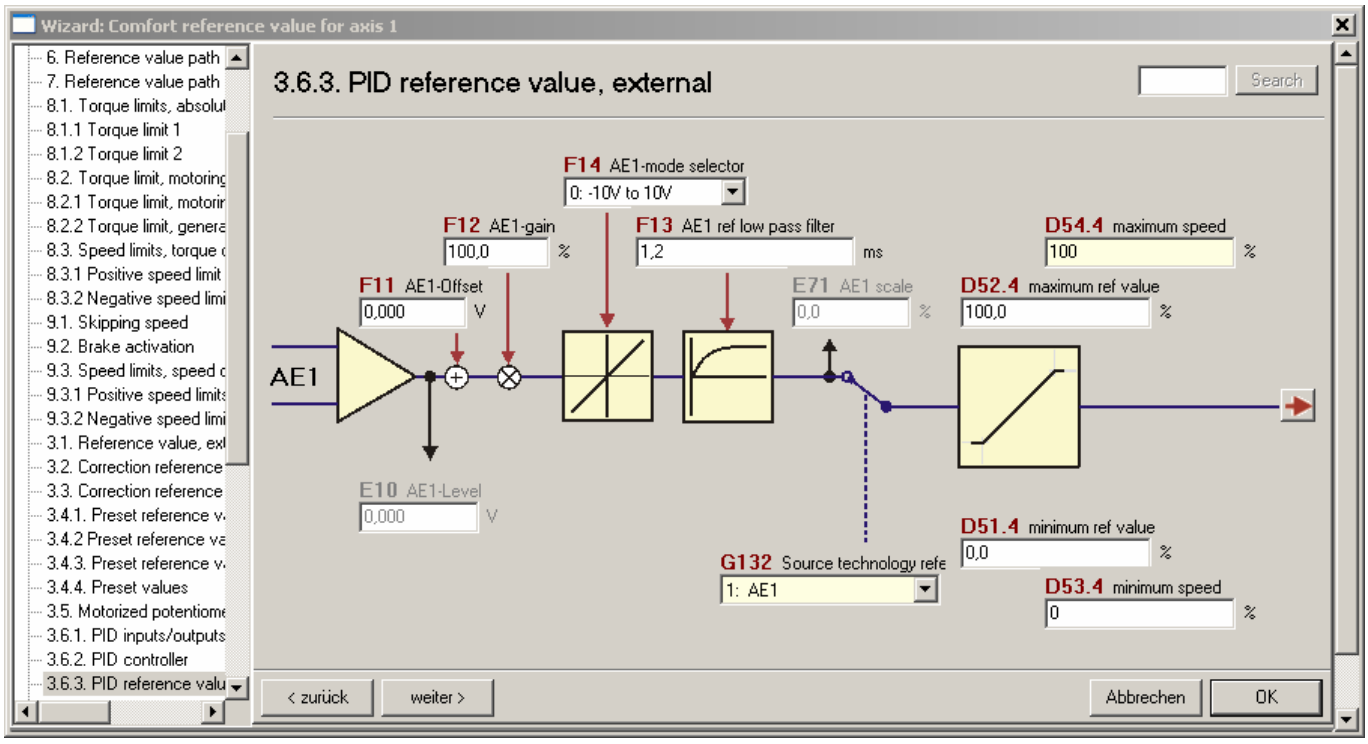

Figure 6-19 Parameterizing the signal source for the external PID reference value

- Set the source of the analog signal in **G132**. You can select the analog signals of the inverter or fieldbus transmission (*4:parameter*).
- Depending on what you select in **G132** additional parameters appear in which you can parameterize the interface (e.g., an offset for the analog input).
- Scale the characteristic curve of the reference value in the parameters **D51**.4 to **D54**.4. The characteristic curve links the selected input area with the set reference value area in user units.
  Example:
  D51.4 = 0.5 V, **D52.**4 = 8 V
  D53.4 = 100 rpm, **D54.**4 = 1500 rpm
  This setting means that 100 rpm is specified when the reference value is 0.5 V and 1500 rpm is specified when the reference value is 8 V. The characteristic curve is calculated linearly between these two points.
- Go to page 3.6.1 of the Assistant.
- If you want to negate the reference value, specify the source of the signal in **G100** with which you want to execute the negation.

How to parameterize the actual value of the controller …

The actual value can be parameterized on page 3.6.4 of the Assistant (Figure 6-20). Proceed as shown below:

- Specify the source of the technology controller in **G133**. You can select the analog inputs or fieldbus transmission.
- If you selected an analog input, additional parameters appear in which you can parameterize the analog interface (e.g., an offset for the analog value).
- If you selected fieldbus transmission enter **G233** in the parameter **G12**. The parameter **G12** gives you the opportunity to use other parameters of the application as actual values. You can use actual values of data type I16 for this.
- Scale the actual value characteristic curve with the parameters **D51**.5 to **D54**.5. The characteristic curve links the selected input area with the set reference value area in user units.
  Example:
  D51.5 = 0.5 V, **D52.**5 = 8 V
  D53.5 = 100 rpm, **D54.**5 = 1500 rpm
  This setting means that 100 rpm is specified when the reference value is 0.5 V and 1500 rpm is specified when the reference value is 8 V. The characteristic curve is calculated linearly between these two points.

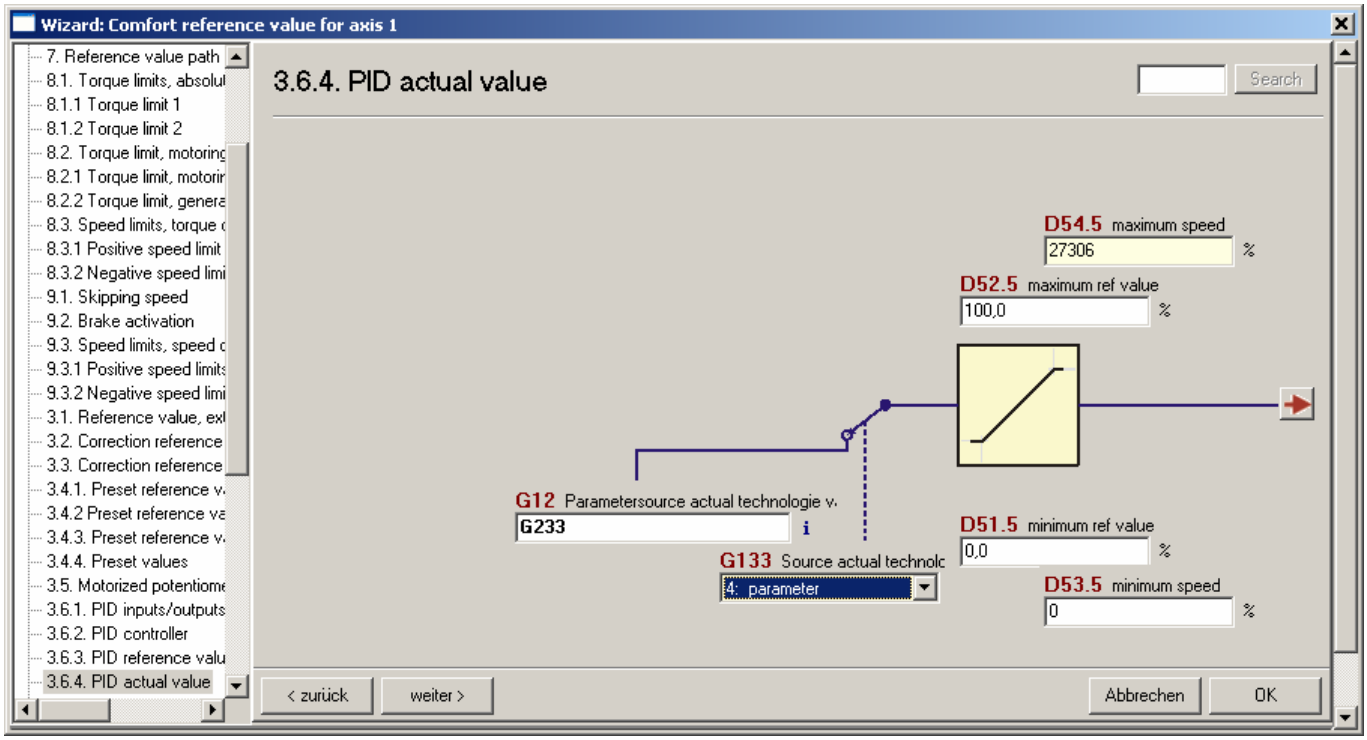

Figure 6-20 Parameterizing the signal source for the actual PID value

NOTE

The characteristic curve for reference value and actual value makes it possible to adjust different scaled sources to each other. This makes the PID control error independent of offset and factor reactions of the signal sources.

- Go to page 3.6.1 of the Assistant.
- Set the actual value low pass in **G11** (Figure 6-21).

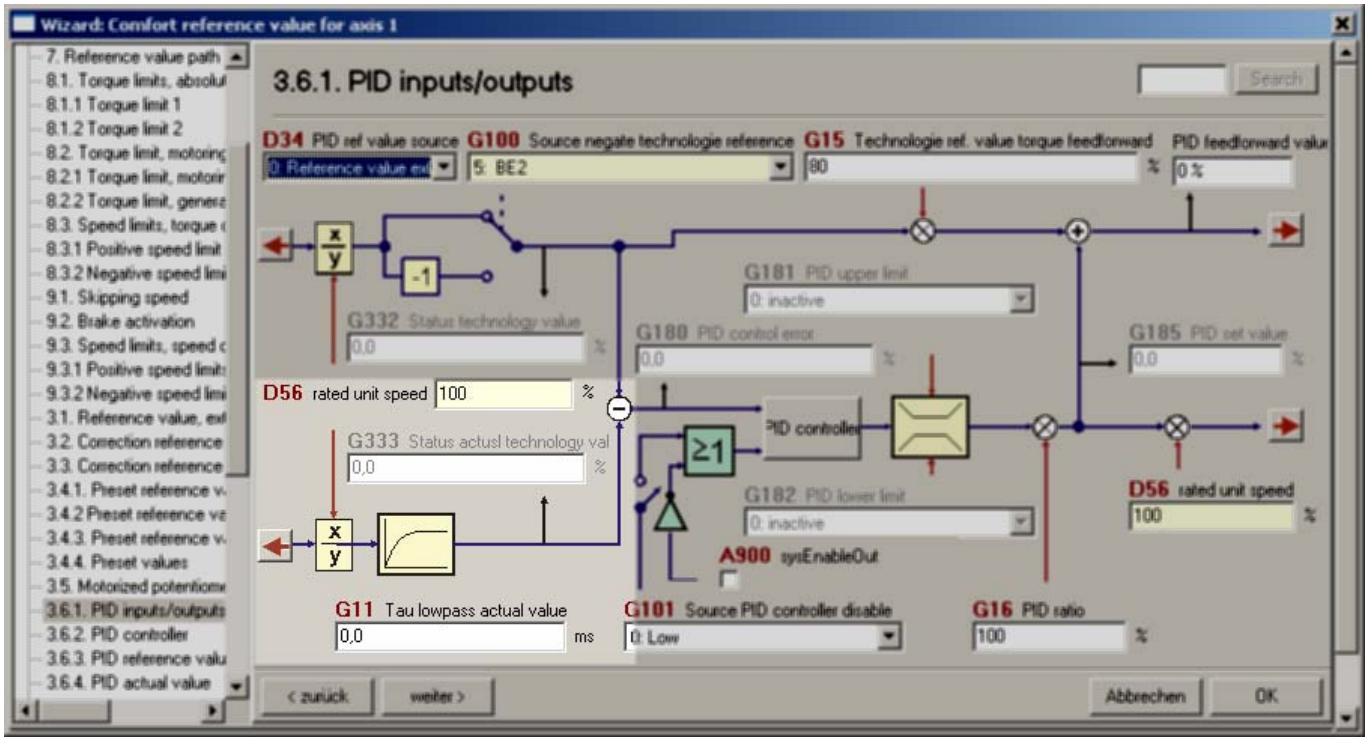

Figure 6-21 Setting the low pass for the actual PID value

The PID control error is calculated from the reference values and the actual values. This variable is given to the PID controller. You can monitor the value online in the parameter **G180** on page 3.6.1 of the Assistant.

How to parameterize the PID controller …

Figure 6-22 shows the structure of the PID controller. The PID controller is parameterized on page 3.6.2 of the Assistant. You can access the page by changing to the page in the Assistant or clicking on the icon for the PID controller on page 3.6.1.
Proceed as described below:

- Set the global gain in the parameter **G00** (loop gain).
- The P-portion is determined by the parameter **G06**. **G18** will give you a feedback message of this controller path during online operation.
- Calculation of the I-portion is parameterized in **G02**. In certain situations such as PID initialization or reaching the PID controller limits, the I-portion is set to values other than those calculated with **G02** (for details, see next few sections). The current I-portion can be read in **G19** during online operation.
- Enter the time constant **G07** in the D path for smoothing the control error. The calculation of the D-portion is parameterized in the parameter **G03**.
- Set the controller limits in **G08** and **G09**. The result of the addition of the P, I and D-portion is limited to these values. Additional information on control operation follows on the next page.

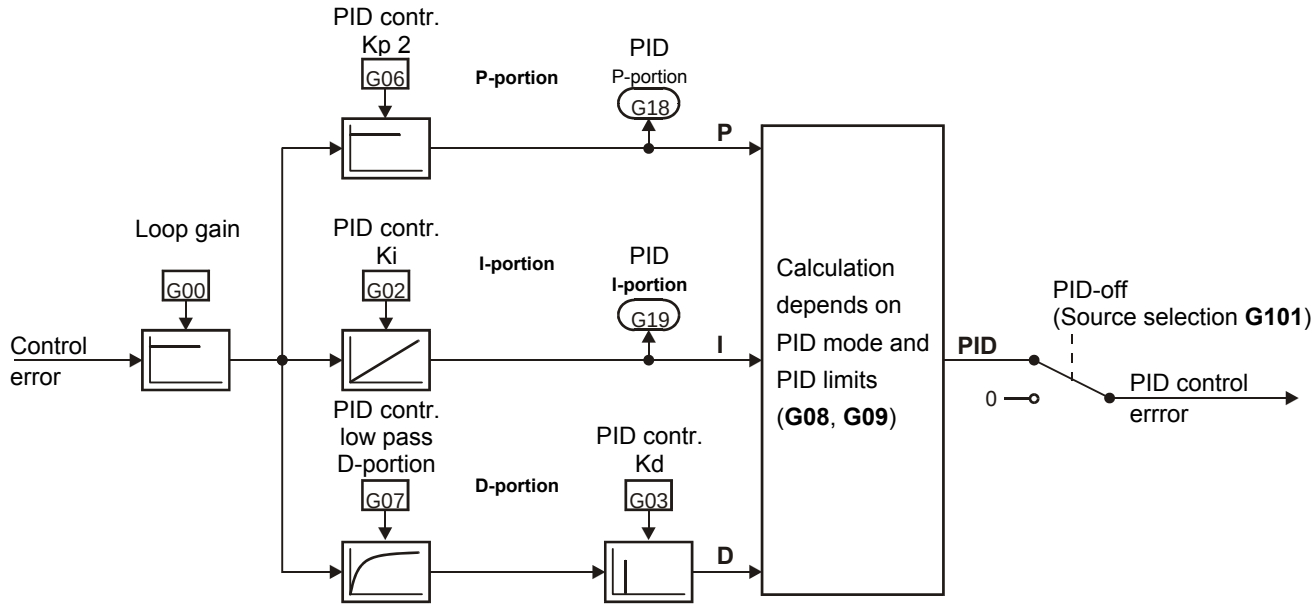

Figure 6-22 PID controller

Additional information on the PID controller

The PID controller has three states:

1. Deactivated – output permanently set to "zero"
2. Control mode
3. Initialization

How to deactivate the PID controller …

When the PID controller is deactivated the PID output is set to zero. There are two cases in which the output is set to zero:

- The enable of the device control **A900** is inactive.
- The binary signal whose source you set in **G101** on page 3.6.1 of the Assistant (Figure 6-23), is active. The PID value continues to be calculated with this signal is active.

A rising edge of **A900** or a falling edge of the selected binary signal enables the output of the PID controller again. The I-portion is forced to the value of **G13**. If this initial value cannot be used for the application various other settings are available for the starting value. Also read about initializing the PID controller in the next few sections.

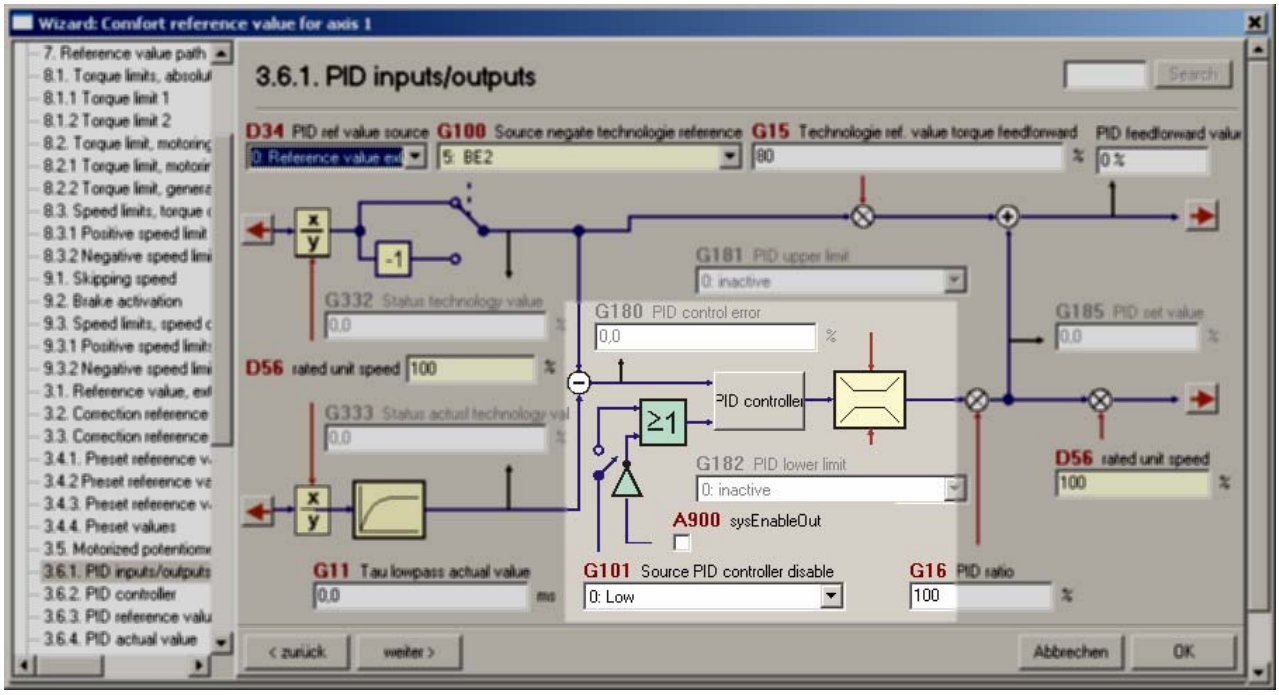

Figure 6-23 Settings for switching the PID controller

Information on control operation

The PID controller output is limited by the parameters **G08** (upper limit) and **G09** (lower limit). When the limitation is active the I-portion is set according to the following conditions:

- If the upper limit is reached (**G08**) and the sum of the P-portion and the D-portion is less than **G08**, then: I=**G08**-P-D and I ≥ 0.
- If the lower limit (**G09**) is reached and the sum of the P-portion and D-portion is greater than **G09**, then: I=**G09**-P-D and I ≤ 0.

How to initialize the PID controller …

An initialization affects the output of the PID controller and the behavior of the I-portion as applicable to the application. You can parameterize the initialization on page 3.6.2 of the Assistant (Figure 6-24).

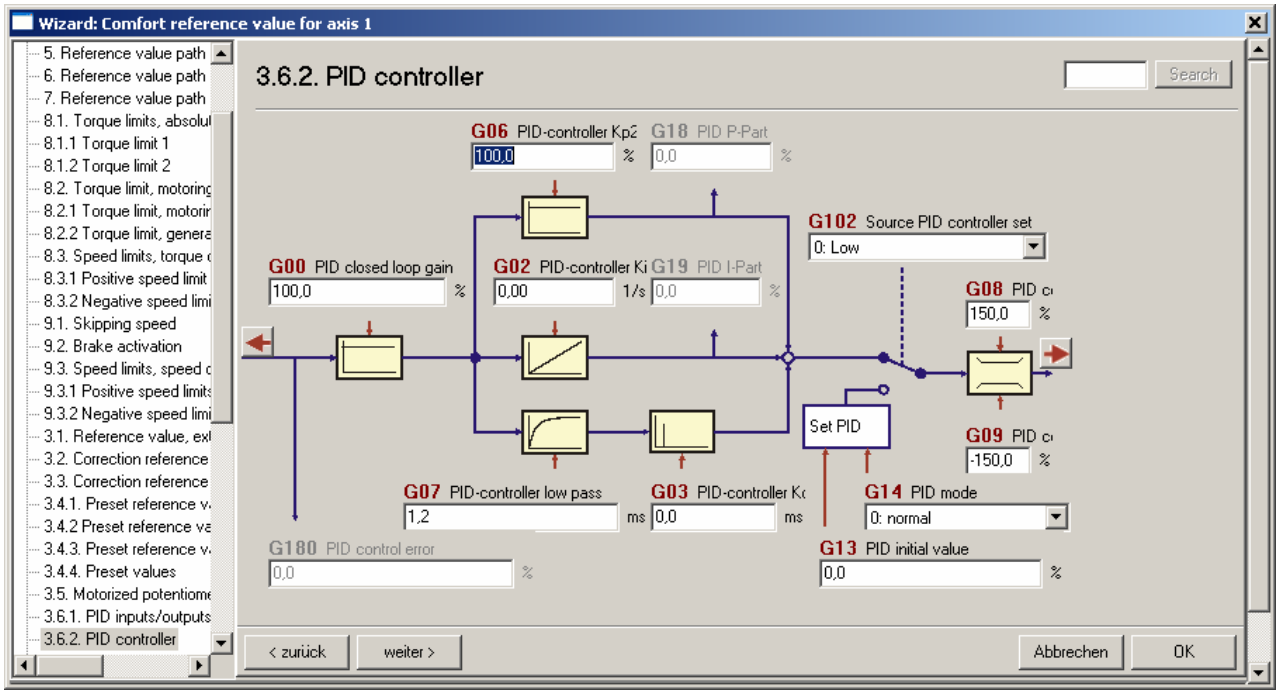

Figure 6-24 PID controller

You can specify in parameter **G102** (set source of PID controller) which signal sets (presets) the PID controller. You can use the setting of **G14** to parameterize how the initialization is to be performed. The following choices are available (Figure 6-25):

- **G14 = 0: Normal**
  When **G14**=0, no initialization takes place with "*set PID controller*" during control operation.
- **G14 = 1: Output = I-Portion = 0**
  When **G14**=1, the output and the I-portion are held to 0% when the "*set PID controller*" signal is queued.
  Practical application:
  The "*set PID controller*" signal is queued before the enable and remains set. The enable is given and the motor is energized. Regardless of the control difference the PID output and the I-portion remain at 0%. The motor is only run via "feed forward." If the system is stable and not vibrating, PID control can be switched on by removing the "*set PID controller*" signal.
- **G14 = 2: Output = I-Portion = G13**
  When **G14**=2, the output and the I-portion are held to the value entered in **G13** (PID initialization value) when the "*set PID controller*" signal is queued.
  Practical application:
  During control mode, the "*set PID controller*" signal can be used to set the output and the I-portion back to the starting value as with *Enable On*.
- **G14 = 3: Output = G13, = I-Portion = Output - P**
  When **G14**=3 and the "*set PID controller*" signal is queued, the output is held to the value entered in **G13** (PID initialization value) and the I-portion sets itself to the value PID - P.
  Practical application:
  During control mode, the "*set PID controller*" signal can be used to freeze the output to the value in **G13** and the I-portion sets itself according to the P-portion.
- **G14 = 4: Output = PID, I-Portion = Hold G13**
  When **G14**=4 and the "*set PID controller*" signal is queued, the output can be calculated according to the control error **G180**, the P-gain **G06** and a fixed I-portion (**G19**=**G13**). The I-portion is held at the value entered in **G13** (PID initialization value).
  Practical application:
  During control mode, the "*set PID controller*" signal together with **G13**=0% can be used to disable the I-portion and control only with the P-portion. This can be useful for vibration analysis.

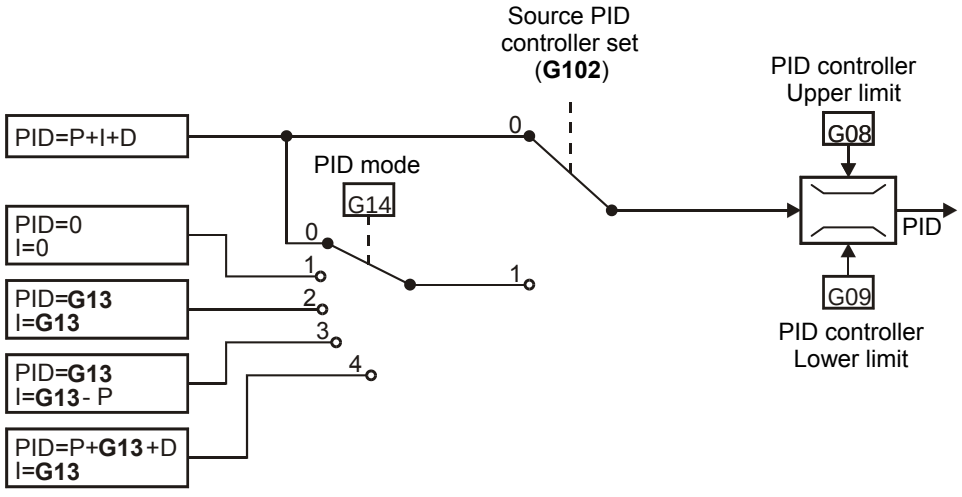

Figure 6-25 Setting the initialization behavior

NOTE

The PID controller can also be switched off with a falling edge of the "*disable PID controller*" signal (monitoring parameter **G301**) and set with the rising edge of the "*enable*" signal (parameter **A900**). However, this setting procedure is different from initialization via PID controller. The PID controller output and the I-portion are always set with **G13** (PID initialization value) when "*enable*" and "*disable PID controller*" occur. "*Set PID controller*" causes the PID controller to be initialized based on the setting of the parameter **G14** (PID mode).

Binary input signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Negate PID reference value	When the signal is active the PID reference value is negated.	**G100**	**D211 Bit4**	**G300**	**-**	**-**
Disable PID controller	When the signal is active the PID controller is disabled.	**G101**	**D211 Bit5**	**G301**	**-**	**-**
Set PID controller	When the signal is active the PID controller mode is activated as per **G14**.	**G102**	**D211 Bit6**	**G302**	**-**	**-**

Analog input signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Scaling
PID reference value	The functions *PID-reference value* and *PID-actual value* can be addressed as analog signals or via fieldbus. A control error is calculated from these signals. The control error is used as the input variable for the PID controller. The reference value set in **G132** is used when **D34** is parameterized to *0:analog signals*.	**G132**	**G232**	**G332**	**D51.4 to D54.4**
PID actual value		**G133**	**(G12)**[1]	**G333**	**D51.5 to D54.5**

[1] When **G133** is set to *4:parameter* the parameter entered in **G12** is used as the source. An I16 parameter is entered in **G12**.

Status signals

Signal	Function	Fieldbus Image	Single Parameter
PID upper limit reached	A high level means that the PID controller has reached the maximum permissible value (can be set with **G08**) on the output.	**D200 Bit7**	**G181**
PID lower limit reached	A high level means that the PID controller has reached the minimum permissible value (can be set with **G09**) on the output.	**D200 Bit8**	**G182**

6.5 N-actual

Description

When the drive follows the master reference value (see chap. 1.2.6), the actual speed is measured. This measured value is used as *n-actual*. When synchronous operation is concluded (i.e., the master reference value is disabled) the slave can be run with its last valid speed when the reference value path with **D30**=*6:n-actual* is used.

7 ADDITIONAL FUNCTIONS

Information that you will find in this chapter…

This chapter gives you information on:

- what other functions you can use with the Comfort Reference Value application
- and how to parameterize these functions.

Available functions

The following functions are described in this chapter.

- Direction of motor: Change drive motor direction with a binary signal
- High resolution n-reference : Additive value on the current reference value
- Stop: Decelerate the drive down to speed 0
- Jog: Reference value for manual mode, with separate ramps and lock logic.
- Motor rotation lock
- Limit switch: Lock of rotation in excess of a certain point.
  The point is indicated with binary signals.
- Local operation: Move the drive with the keyboard of the inverter
- Motor direction: Specification of the direction of the machine

How to parameterize the functions motor direction, high-resolution n-reference and stop ….

The functions motor direction, high-resolution n-reference value and stop are parameterized on page 4 of the Assistant (Figure 7-1). Proceed as shown below:

- If you want to negate the current reference value (value as per combination or master reference value), enter a signal source in **D100**. When the signal has a low level the reference value is output unchanged. When the signal has a high level the sign of the reference value is inverted.
- After the negation you can then use the high-resolution n-reference function to have an additive effect on the value from the **D384** indication. The result is indicated in **D385**. The high-resolution n-reference function affects both a combined reference value and a master reference value. It is not dependent on the type of reference value selected on page 1 of the Assistant.
- If you want to trigger a stop during operation select the source of the stop signal in **D102**. When this signal is active the stop is executed. The drive stops with the ramp set in **D84**.

NOTE

When a stop is triggered during torque control, then automatically speed operation is used. The drive will be stopped to a standstill with speed control. If you delete the stop signal automatically torque control is used again.

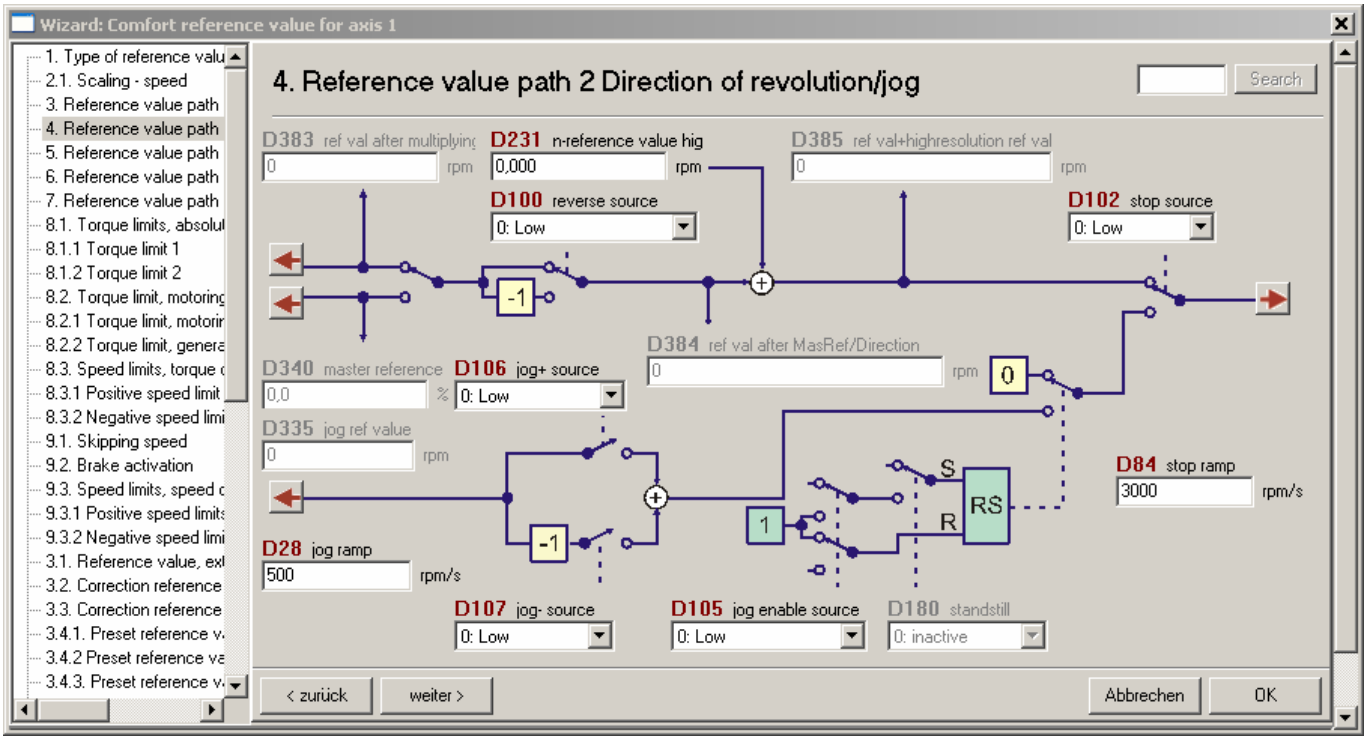

Figure 7-1 Settings for direction of revolution and jogging

How to parameterize the jog function …

As you can see in Figure 7-1 a stop signal must be triggered to activate the jog function. When the drive has reached the speed window ± **C40** the jog reference value can be enabled by the jog enable.

To parameterize proceed as shown below:

- Set a source for the stop signal in **D102** if you haven't yet selected the signal source.
- Select the source of the jog enable in **D105**. The jog reference value is not used until the jog enable becomes active. The jog enable can also be implemented via **D55** Bit 3 and a simultaneously queued additional enable 2. (See chap. 9.4.)
- Parameterize the sources for the jog+ and jog- signals in **D106** and **D107**. If neither signal is active the jog reference value is 0. If jog+ is active, the jog reference value is passed on unchanged. If jog- is active the jog reference value is negated. If both signals are on, the reference value is set to 0.
- Enter the ramp of the jog reference value in **D28**.

How to parameterize the jog reference value …

After making the settings on page 4 of the Assistant, go to page 3.7 (Figure 7-2) to parameterize the jog reference value. Proceed as shown below:

- Set the signal source of the jog reference value in **D135**. The reference value is read from **D235** in fieldbus operation (**D135** = *4:parameter*) or as a constant value.
- If you selected an analog input in **D135** additional parameters are indicated. Set the input with these parameters (e.g., analog input offset).
- Scale the characteristic curve with array parameters **D51**.3 to **D54**.3. Scaling specifies the correct counter-value in user units for each input value.
  Example for external reference value:
  D51.3 = 0.5 V, **D52**.3 = 8 V
  D53.3 = 100 Rpm, **D54**.3 = 1500 Rpm
  This setting means that 100 Rpm is specified for a reference value of 0.5 V and 1500 Rpm for 8 V. The curve is calculated linearly from these two points.

NOTE

Since triggering the stop function in torque mode causes a switch to speed control (regardless of the settings on page 1 of the Comfort Reference Value Assistant), jog mode is only possible with speed control.

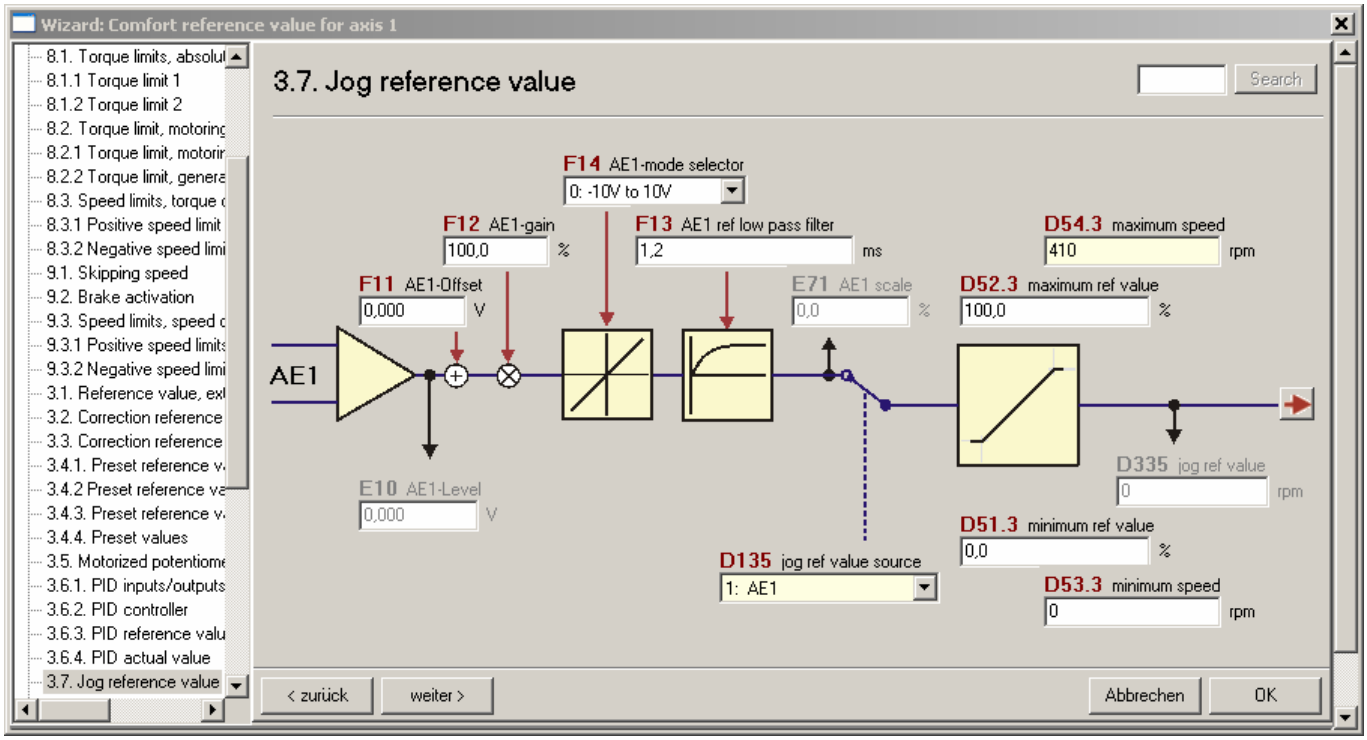

Figure 7-2 Parameterizing the signal source of the jog reference value

How to parameterize the functions direction block, limit switch and local operation (key hand function) …

Parameterize the functions direction block, limit switch and local operation on page 6 of the Assistant (Figure 7-3). Proceed as shown below:

- Set the sources of the signals in **D108** and **D109** which you want to use to block the direction of rotation. If one of the signals is active the respective direction is blocked. You can only proceed in the opposite direction.
- Parameterize the limit switches by first setting the signal sources in **D103** and **D104**. If one of the signals has a low level the direction exceeding the limit switch is blocked. If limit switch + triggers you can only proceed in the negative direction. If limit switch - has a low level only a positive direction is possible.
  Keep in mind the details on the next page on the subject of limit switches.
- Select in **D35** whether the drive is to be decelerated with a stop or quick stop ramp when a limit switch is triggered. When the setting is *0:quickstop ramp*, **D85** is used. When the parameterization is *1:stop ramp*, **D84** takes effect when the value of **D84** is not zero. If this is not the case **D85** quick stop ramp is also used for this setting.
- Enter the stop ramp in **D84** and the quick stop ramp in **D85**.
- In **C08** set the maximum torque with which the drive is decelerated during a quick stop. The limits in **C03**, **C05** or other limits specified in the application are ignored during the quick stop.
- Activate **A55** if you want to proceed in local mode. Local mode is activated and enabled via the display of the inverter.

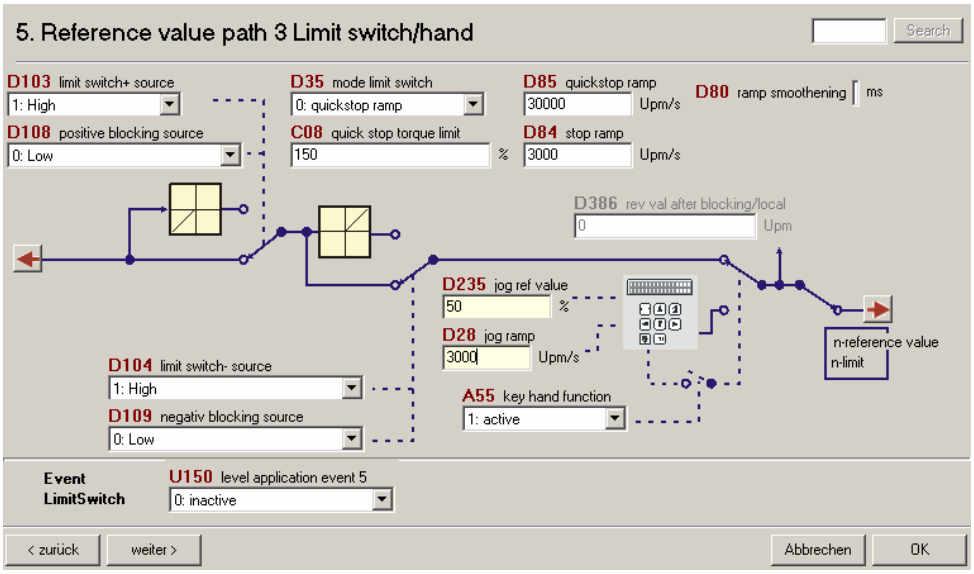

Figure 7-3 Settings for the limit switch and local operation (key hand) functions

Details on limit switches …

When the drive reaches a limit switch application event 5 is triggered. You can parameterize the event to inactive level, message, warning or fault. The limit switch is reset when the drive leaves the limit switch in the opposite direction. This means, for example, when the positive limit switch triggers and the speed is negative, a falling edge of the limit switch must be determined.

If a fault was triggered, you can reset the event and then move in the permissible direction away from the limit switch.

A limit switch mix-up is caught by also polling the speed when the switch is triggered. If the inverter determines a negative speed when the positive limit switch is triggered, the inverter is blocked. The device cannot be re-enabled until you turn it off and on again.

Remember that it is essential to reverse the connections of the limit switches or re-parameterize and save before you turn on the device again.

CAUTION

- When the speed is polled and a value less than ± **C40** is determined, no direction can be assumed. However, to reset the limit switch anyway, you can delay the limit switch signal with the switchoff delay until the speed is greater than ± **C40**.
- The limit switches are evaluated internally as break-contacts. When make-contacts are connected as limit switches, the binary input in **D103** or **D104** must be selected inverted (e.g., *4:BE1-inverted*).

Details on local operation (key hand function)

Press the button to access local operation.

- You can enable and disable the drive with the I/O button.
- The motor stops when the ESC button is pressed.
- Use the ◄ ► buttons to move at the speed specified in **D235** as long as the button is pressed. The value specified in **D28** is the acceleration and deceleration ramp.
- A motor potentiometer is simulated with the ▲ ▼ buttons. The value specified in **D28** is the acceleration and deceleration ramp.

CAUTION

If the device remains in the "switch-on disable" device state because the state is obtained with a given enable (for bus enable and additional enable) and if a change is then made to local operation, the inverter is enabled when local operation is exited! This can cause the drive to move.

How to set the motor direction … You can use **D57** to invert the direction of the motor regardless of the reference value or the type of reference value. **D57** can be used to adjust to a change in mounting position or a change in the number of stages of a gear unit.
This parameter is available on page 7 of the Assistant.

Binary signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Reverse direction	When the signal is active the current direction is reversed.	**D100**	**D210 Bit0**	**D300**	**D400.0**	**D400.1**
External fault	When the signal is active the device changes to the "fault" state.	**D101**	**D210 Bit1**	**D301**	**D401.0**	**D401.1**
Stop	When the signal is active the reference value 0 is specified. The motor stops.	**D102**	**D210 Bit2**	**D302**	**D402.0**	**D402.1**
Jog enable	When the drive reaches a standstill with the stop signal active (motor speed is within ±**C40** window), jog mode can be enabled with the "jog enable."	**D105**	**D210 Bit5**	**D305**	**D405.0**	**D405.1**
Jog +	When jog mode is enabled and the jog+ signal is active the "jog reference value" signal is output unchanged.	**D106**	**D210 Bit6**	**D306**	**-**	**-**
Jog -	When jog mode is enabled and the jog+ signal is active the "jog reference value" signal is output negated.	**D107**	**D210 Bit7**	**D307**	**-**	**-**
Block positive direction	When the "block positive direction" signal assumes the value *1:active* no positive reference values are processed.	**D108**	**D210 Bit8**	**D308**	**D408.0**	**D408.1**
Block negative direction	When the "block negative direction" signal assumes the value *1:active* no negative reference values are processed.	**D109**	**D210 Bit9**	**D309**	**D409.0**	**D409.1**
Limit switch +	When the level of the signals "limit switch + and limit switch - is high application event 5 is triggered. The type of reaction and the display text can be specified in parameters **U150** to **U152**. The device changes to the "fault" state with the standard setting. The direction is blocked when the limit switch is passed. After the fault is acknowledged movement can continue in the direction opposite to the switch.	**D103**	**D210 Bit3**	**D303**	**D403.0**	**D403.1**
Limit switch -		**D104**	**D210 Bit4**	**D304**	**D404.0**	**D404.1**

Analog signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Scaling
Jog reference value	The "*jog reference value*" signal can be controlled via analog input or fieldbus.	**D135**	**D235**	**D335**	**D51.3 to D54.3**

Status signals

Signal	Function	Fieldbus Image	Single Parameter
Direction	Indication of the "direction" signal regardless of the source set in **D100**.	**D201 Bit0**	**D300**
Active direction	The signal shows the direction at the end of the reference value path. A low level means a positive reference value. A high level means a negative reference value. The parameter **D57** does not affect this signal.	**D201 Bit1**	**D430**
Jog active	The signal is *1:active* when all the following conditions are fulfilled: - The jog enable (selector **D105**) or the jog reference value enable (**D55** and **D113** additional enable 2) is active. - A stop command (selector **D102**) is queued. - The speed has reached the range -**C40** to +**C40** once.	**D201 Bit8**	**D437**
Stop active	When the level is high a stop command is queued (**D302**) and the actual motor speed has reached the range -**C40** to +**C40** once.	**D201 Bit9**	**D438**
Limit switch	When the level is high one of the limit switches has triggered (**D303** or **D304**).	**D202 Bit13**	**D462**
Warning	When the level is high a warning was determined (**E81** = 2).	**D202 Bit14**	**D463**
Switch-on disable	When the level is high the inverter is in the state "switch-on disable" (**E48** = 1).	**D202 Bit15**	**D464**

8 PARAMETERIZING THE SPEED AND TORQUE LIMITS

Information that you will find in this chapter …

This chapter gives you information on:

- the torque and speed limits which the Comfort Reference Value application offers
- how to change these limits during operation
- and how to set the limits.

8.1 Torque Limits

Information that you will find in this section …

This section gives you information on:

- what absolute or motoring / generating torque limits are
- which torque limits apply in speed and torque operation
- and how the torque can be limited by additional functions.

You can choose between absolute and motoring / generating limits for variable torque limitation. Remember that motoring / generating limitation is only available with speed control.

Absolute torque limits

Absolute torque limits are not dependent on the direction of speed and torque.

Two absolute torque limits can be used in the Comfort Reference Value application. The limits are designed as analog signals so that the limits can be changed during operation. The absolute torque limits are available in both speed and torque control.

You can switch between the limits during operation with a binary signal. This can be used to increase the torque during a heavy duty startup, for example.

How to parameterize absolute torque limits …

Absolute torque limits are parameterized on page 8.1 of the Assistant (Figure 8-1). Proceed as shown below:

- Parameterize the source of the switchover signal in **D110**. When the signal is low the value from **C330** torque limit is used. When the signal is high the value from **C331** torque limit 2 is used.
- Go to page 8.1.1 to set the first torque limit.

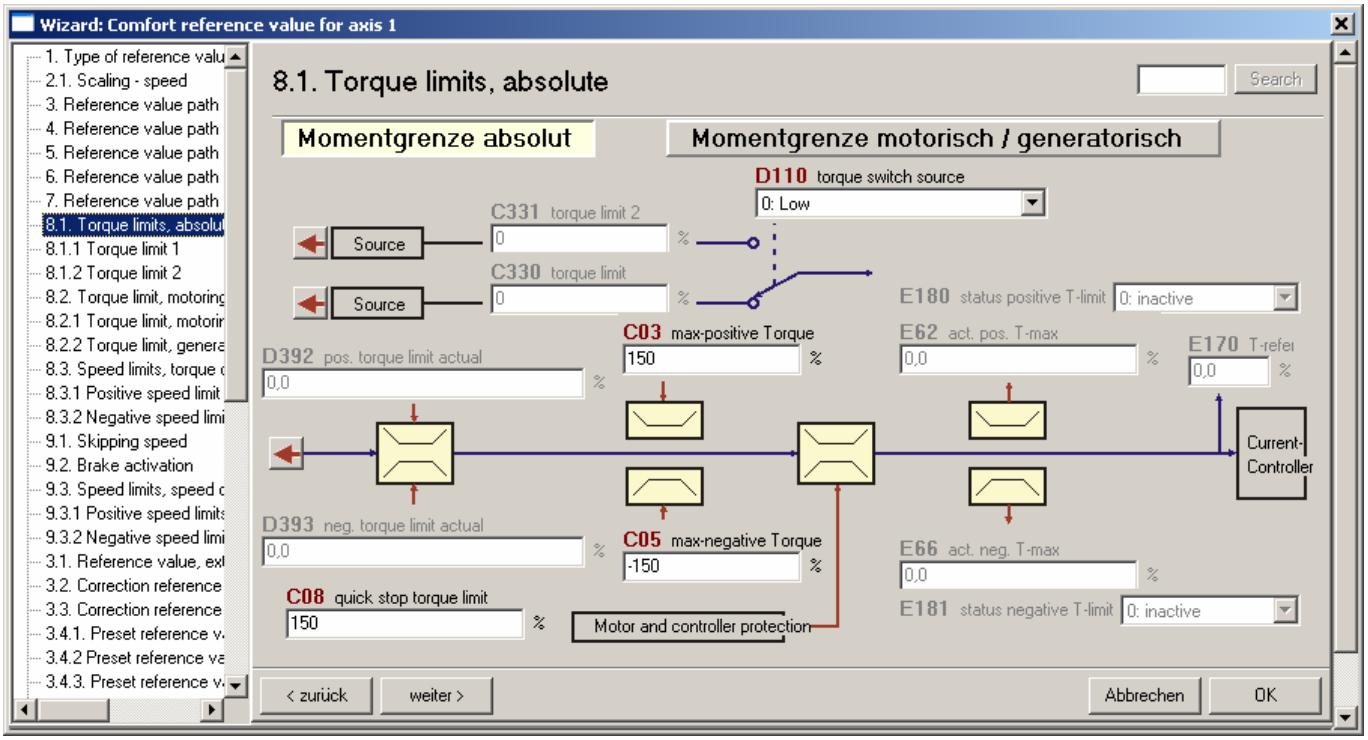

Figure 8-1 Setting the absolute torque limits

- On page 8.1.1 set the source for the first torque limit in **C130** (Figure 8-2). You have a choice of either an analog input or fieldbus operation (setting *4:parameter*).
- If you selected an analog input additional parameters appear which you can use to parameterize the interface.
- Adjust the factor torque limit **C06**.
- Go to page 8.1.2 to parameterize the second torque limit. Proceed as for the first torque limit.

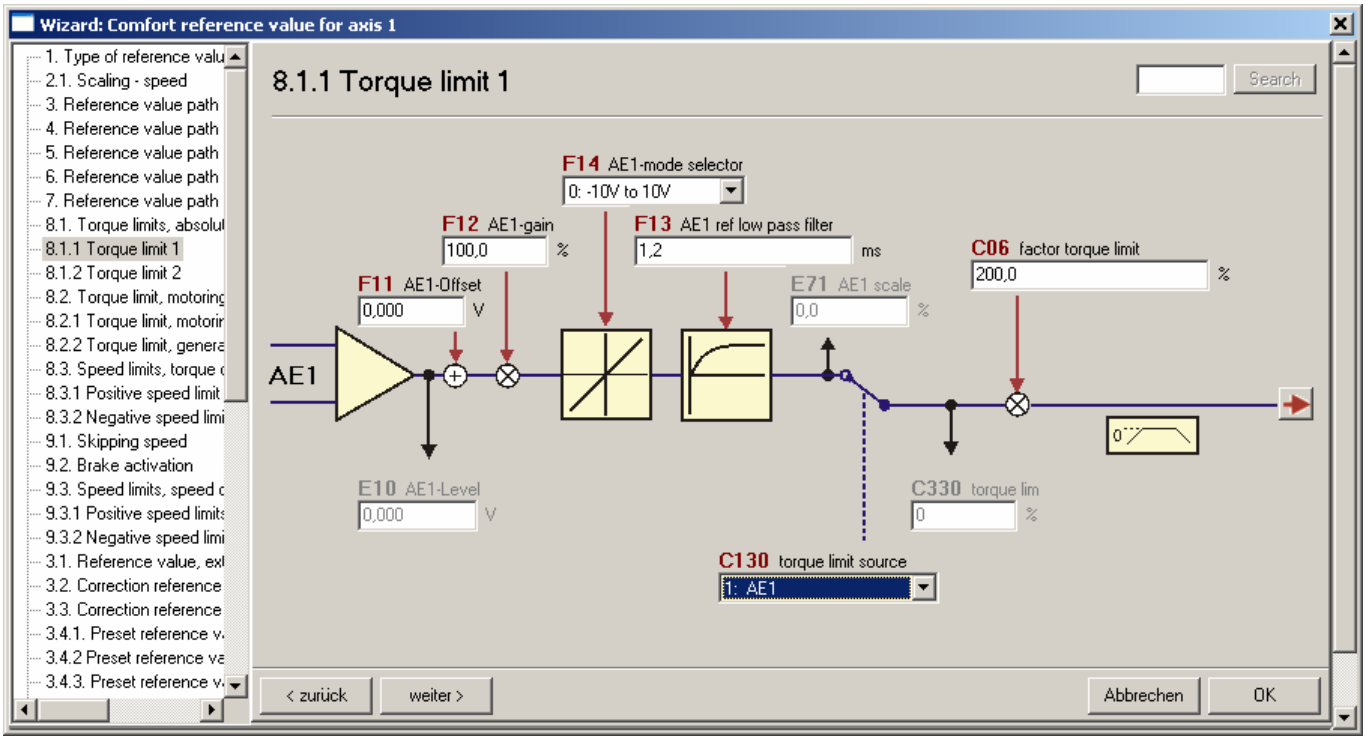

Figure 8-2 Setting the signal source for torque limit 1

Motor-generated torque limits

Enter a maximum motor torque and a maximum generated torque for the motor-generated limitation. You can also change these limits with analog signals during operation. Changing the motor-generated limitation is only useful with speed control. The limitation does not become active until the display parameters **C332** and **C333** have a value other than zero. This deactivates absolute limitation.

How to parameterize the motor-generated limits ...

The motor-generated torque limits are parameterized on pages 8.2.1 (Figure 8-3 - motor) and 8.2.2 (Figure 8-3 - generated) of the Assistant. Page 8.2 gives you an overview of the entire limitation procedure. Proceed as shown below:

- On page 8.2.1 set the source of the motor torque limit in parameter **C132**. You have a choice of either an analog input or fieldbus operation (setting *4:parameter*).
- If you selected an analog input, additional parameters appear which you can use to parameterize the interface (e.g., analog input offset).
- If you selected fieldbus operation, the parameter **C232** appears which you will write via fieldbus or with a constant value.
- Go to page 8.2.2 of the Assistant to parameterize the generating torque limit. Proceed as described for the motor torque limit.

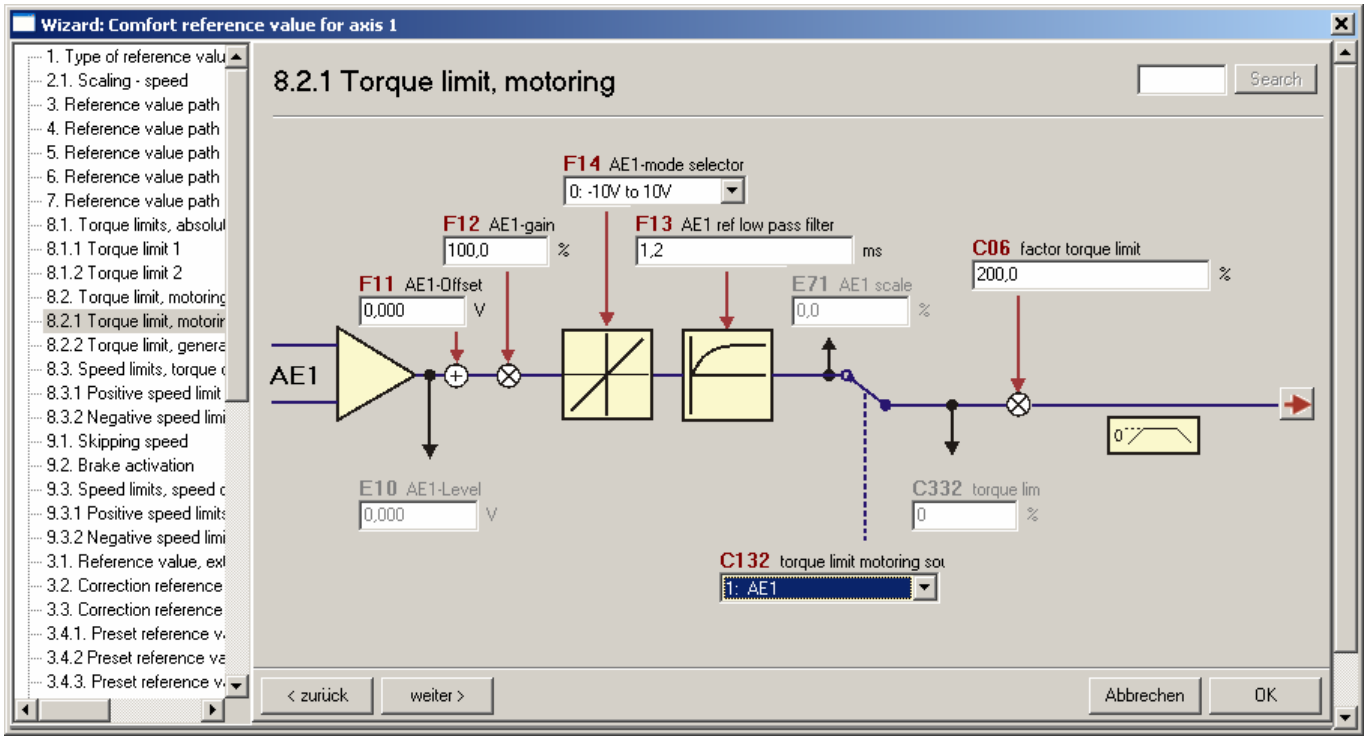

Figure 8-3 Setting the signal source for the motor torque limit

Additional ways to limit the torque

As you can see on pages 8.1 und 8.2 (Figure 8-4) the current torque can be limited by further limitations. The effective torque limit is the minimum of:

- either the absolute or the motor-generating torque limit
- the parameters **C03** positive torque limit or **C05** negative torque limit
- and the functions for motor and controller protection (e.g., the i^2t model).

During online mode you can see the valid torque limit in the parameters **E62** (current positive torque limit) and **E66** (current negative torque limit). The parameters **E180** and **E181** indicate whether the particular limit is exceeded.

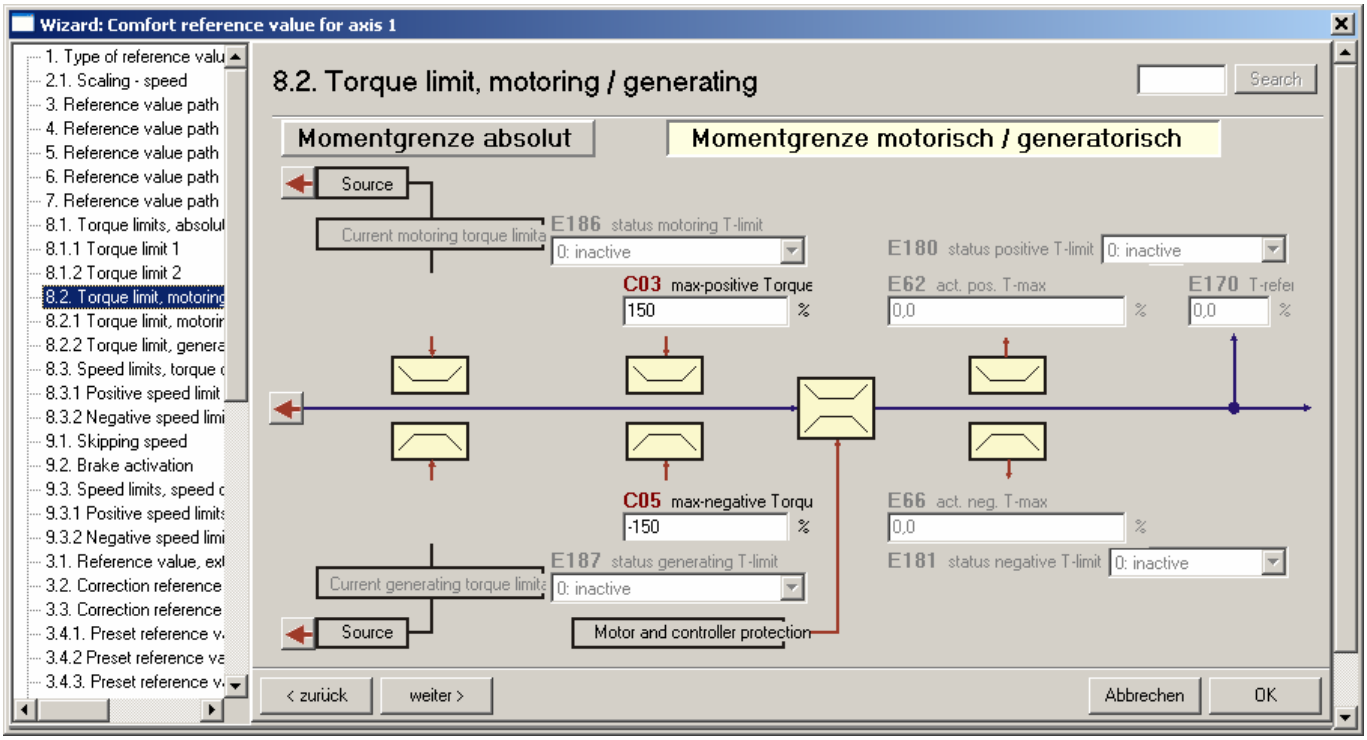

Figure 8-4 Setting the motor/generating torque limits

Binary input signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Time ON	Time OFF
Torque switchover	Binary signal for switching between the absolute torque limits (selectors **C130** and **C131**). When the signal is low *torque limit* (**C330**) is used. When the signal is high *torque limit 2* (**C331**) is active.	**D110**	**D210 Bit10**	**D310**	**D410.0**	**D410.1**

Analog input signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Scaling
Torque limit (absolute)	Absolute torque limits. The "torque switchover" signal can be used to switch between the limits (e.g., for a heavy duty startup). These limits remain valid as long as **C332** and **C333** are zero.	**C130**	**C230**	**C330**	-
Torque limit 2 (absolute)		**C131**	**C231**	**C331**	-
Torque limit (motor)	Torque limits for motor-generating limitation during speed control. These limits are active when **C332** and **C333** contain a value other than zero.	**C132**	**C232**	**C332**	-
Torque limit (generating)		**C133**	**C233**	**C333**	-

Status signals

Signal	Function	Fieldbus Image	Single Parameter
Torque limit active (static)	When the signal is high the torque has reached the positive or negative torque limit.	**D200 Bit2**	**D182**
Positive torque limit status	When the signal is high the torque has reached the positive torque limit.	**D200 Bit3**	**E180**
Negative torque limit status	When the signal is high the torque has reached the negative torque limit.	**D200 Bit4**	**E181**

Signal	Function	Fieldbus Image	Single Parameter
Motor torque limit status	When the signal is high the torque has reached the motor torque limit.	**D200 Bit5**	**E186**
Generating torque limit status	When the signal is high the torque has reached the generating torque limit.	**D200 Bit6**	**E187**
Motor/generating torque limit	When the signal is high the torque limits are specified as motor and generating (i.e., the values in **C332** and **C333** are not zero).	**D201 Bit7**	**D436**

8.2 Speed Limits

Information that you will find in this section …

This section gives you information on:

- which types of speed limits are offered in torque and speed control
- and how to parameterize these speed limits.

Separate speed limits are available for speed and torque control. The positive and negative limit can be influenced separately for each control mode and, during operation, via an analog signal.

How to parameterize the speed limits during torque control …

See page 8.3 of the Assistant for an overview of the speed limits during torque control. Go to page 8.3.1 to parameterize the positive speed limit. Go to page 8.3.2 to parameterize the negative speed limit. To parameterize the speed limit proceed as described below:

- On page 8.3.1 select the source of the positive speed limit in parameter **D136** (Figure 8-5). You have a choice of either an analog input or fieldbus operation.
- If you selected an analog input further parameters appear which you can use to parameterize the interface.
- If you selected fieldbus operation the parameter is indicated which you will write via fieldbus or with a constant value.
- Go to page 8.3.2 of the Assistant to parameterize the negative speed limit. Proceed as described for the positive limit.

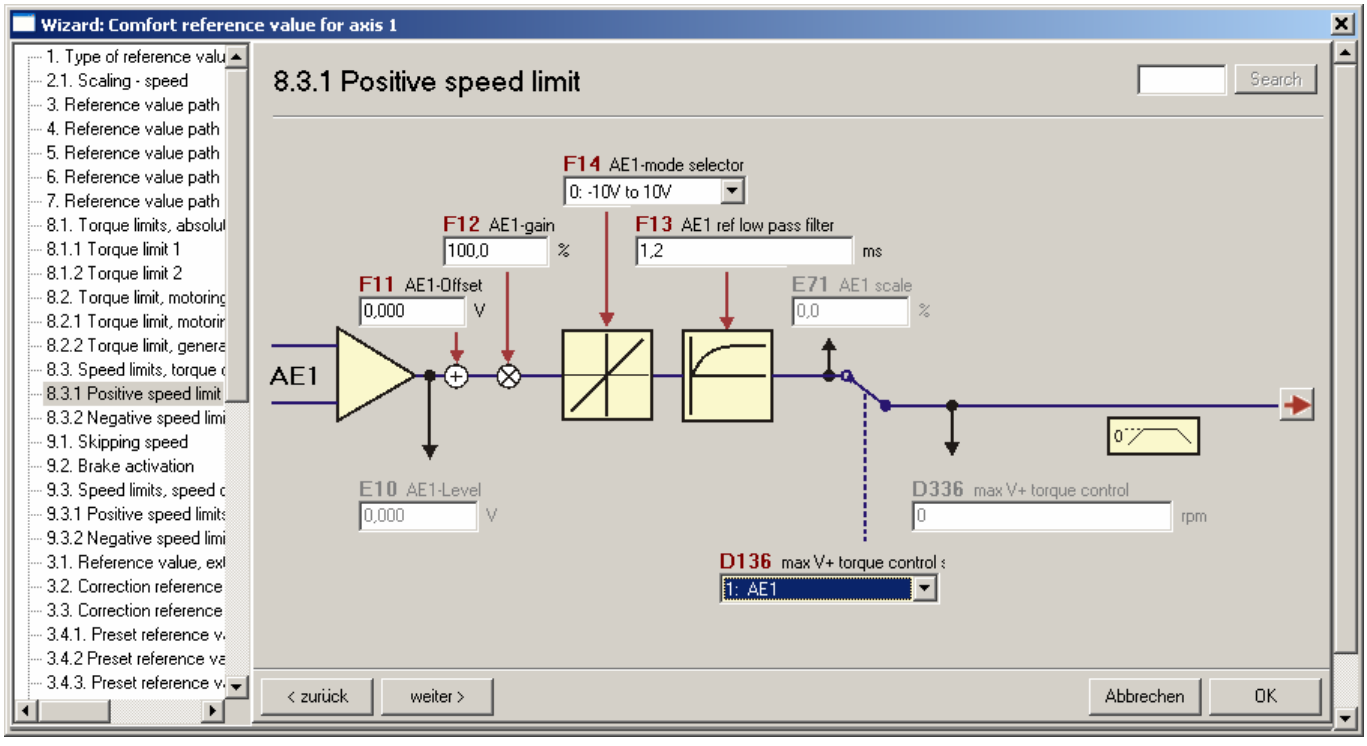

Figure 8-5 Setting the signal source for the positive speed limit during torque control

NOTE

The speed limits can only be set in Rpm (speed of the motor) during torque control. The display in user units is reserved for scaling the torque or the force.

How to parameterize speed limits during speed control …

Page 9.3 of the Assistant gives you an overview of the speed limits during speed control. The positive speed limit is parameterized on page 9.3.1. The negative speed limit is parameterized on page 9.3.2. To parameterize the speed limit proceed as described below:

- On page 9.3.1 select the source of the positive speed limit in parameter **D138** (Figure 8-6). You have a choice of either an analog input or fieldbus operation.
- If you selected an analog input further parameters appear which you can use to parameterize the interface.
- If you selected fieldbus operation the parameter is indicated which you will write via fieldbus.
- Go to page 9.3.2 of the Assistant to parameterize the negative speed limit. Proceed as described for the positive limit.

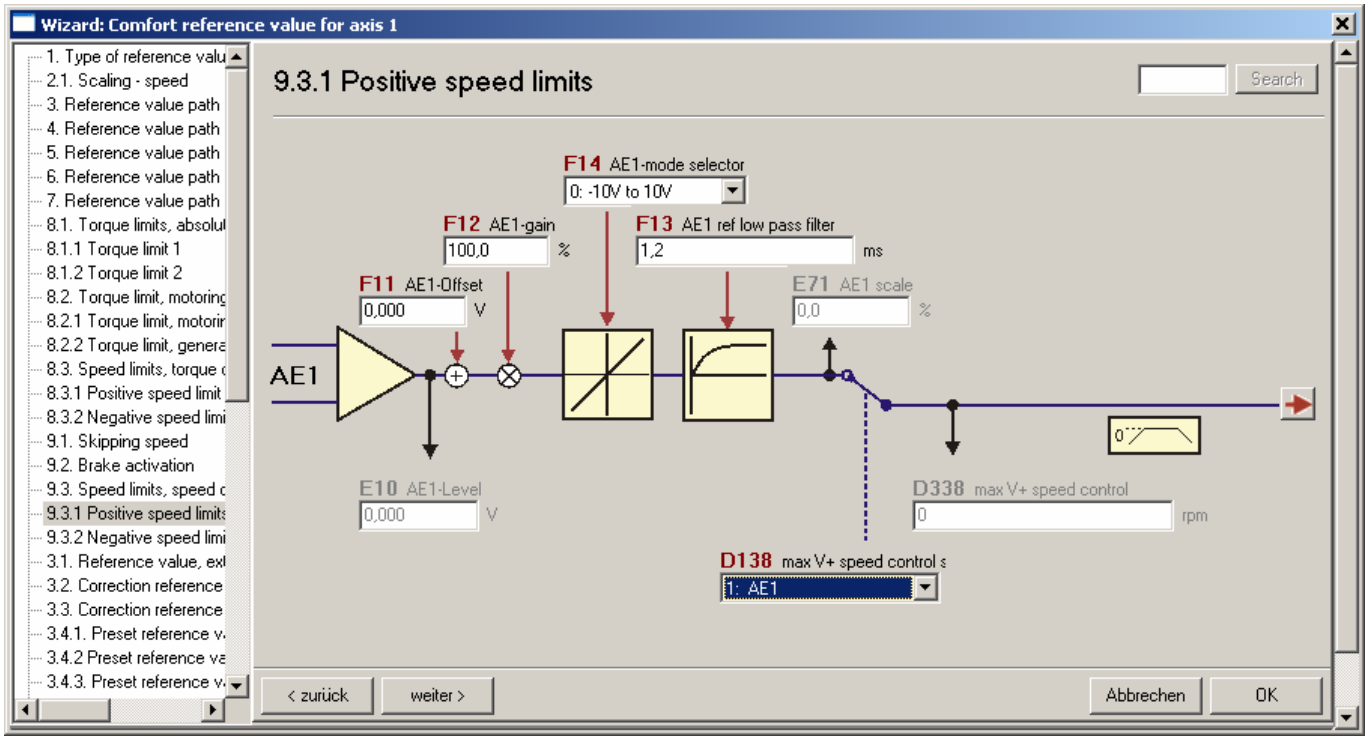

Figure 8-6 Setting the signal source of the positive speed limit during speed control

NOTE

Limits set in these parameters do not deactivate the speed limit **C01**. **C01** may have to be adjusted to prevent premature limitation by this parameter.

Analog signals

Signal	Function	Selector	Fieldbus Image	Display Parameter	Scaling
Max pos. speed, torque control	Positive speed limit with torque control	**D136**	**D236**	**D336**	-
Max. neg. speed, torque control	Negative speed limit with torque control	**D137**	**D237**	**D337**	-
Max. pos. speed, speed control	Positive speed limit with speed control	**D138**	**D238**	**D338**	-
Max. neg. speed, speed control	Negative speed limit with speed control	**D139**	**D239**	**D339**	-

Signal	Function	Fieldbus Image	Single Parameter
Standstill	When the signal is high the actual motor speed has reached the value 0 Rpm, ± **C40**.	**D200 Bit0**	**D180**
Reference value reached	When the signal is high the ramp generator has reached the reference value.	**D200 Bit1**	**D181**
Actual value reached	When the signal is high the motor speed (**E91**) has reached the reference specification (**E07**), ± **C40**.	**D200 Bit9**	**D183**
Reference value prohibited	When the signal is high a positive or negative reference value is specified although the applicable direction is disabled (**D308** = *1:active* or **D309** = *1:active*).	**D200 Bit10**	**D184**
Max. speed limit reached	When the signal is high the reference value has reached the speed limit which is specified by the source set in **D138**.	**D200 Bit11**	**D185**
Min. speed limit reached	When the signal is high the reference value has reached the speed limit which is specified by the source set in **D139**.	**D200 Bit12**	**D186**
Zero ramp reached	When the signal is high the ramp generator has reached the value 0.	**D200 Bit15**	**D189**

Signal	Function	Fieldbus Image	Single Parameter
Scan active	When the signal is high the drive is in "scan active" mode as per **C20**.	**D201 Bit4**	**D433**
Heavy duty start	When the signal is high the drive is in "heavy duty start" mode as per **C20**.	**D201 Bit5**	**D434**
Reference value ready	The signal is active when the inverter is enabled and the brake is open.	**D201 Bit6**	**D435**
Positive torque active	When the signal is high the current torque (**E90**) as related to the user direction (**D57**) is greater than 5%.	**D201 Bit11**	**D440**
Negative torque active	When the signal is high the current torque (**E90**) as related to the user direction (**D57**) is less than -5%.	**D201 Bit12**	**D441**
Forward direction	When the signal is high the speed (**E91**) as related to the inverted user direction (**D57**) is greater than **C40**.	**D201 Bit13**	**D442**
Accelerating	When the signal is high the motor speed increases.	**D201 Bit14**	**D443**
Decelerating	When the signal is high the motor speed decreases.	**D201 Bit15**	**D444**

9 ADDITIONAL FUNCTIONS

Information that you will find in this chapter …

This chapter gives you information on:

- skipping speed
- brake activation
- range control and display scaling and
- events.

9.1 Skipping Speed

How to parameterize skipping speeds …

System vibration can be prevented by skipping over speeds in certain sympathetic vibration areas. A total of 4 skipped speed areas can be defined. Go to page 9.1 of the Assistant (Figure 9-1) to parameterize the skipping speeds. Proceed as described below:

- Enter a speed in **C11**.x. The value should be in the middle of the area to be skipped.
- Enter a speed range in **C10**.x. The area to be skipped is calculated as follows from this:
  Range = (**C11**.x – **C10**.x) to (**C11**.x + **C10**.x)

Parameters with the same parameter element create one skip (e.g., **C10**.4 with **C11**.4).

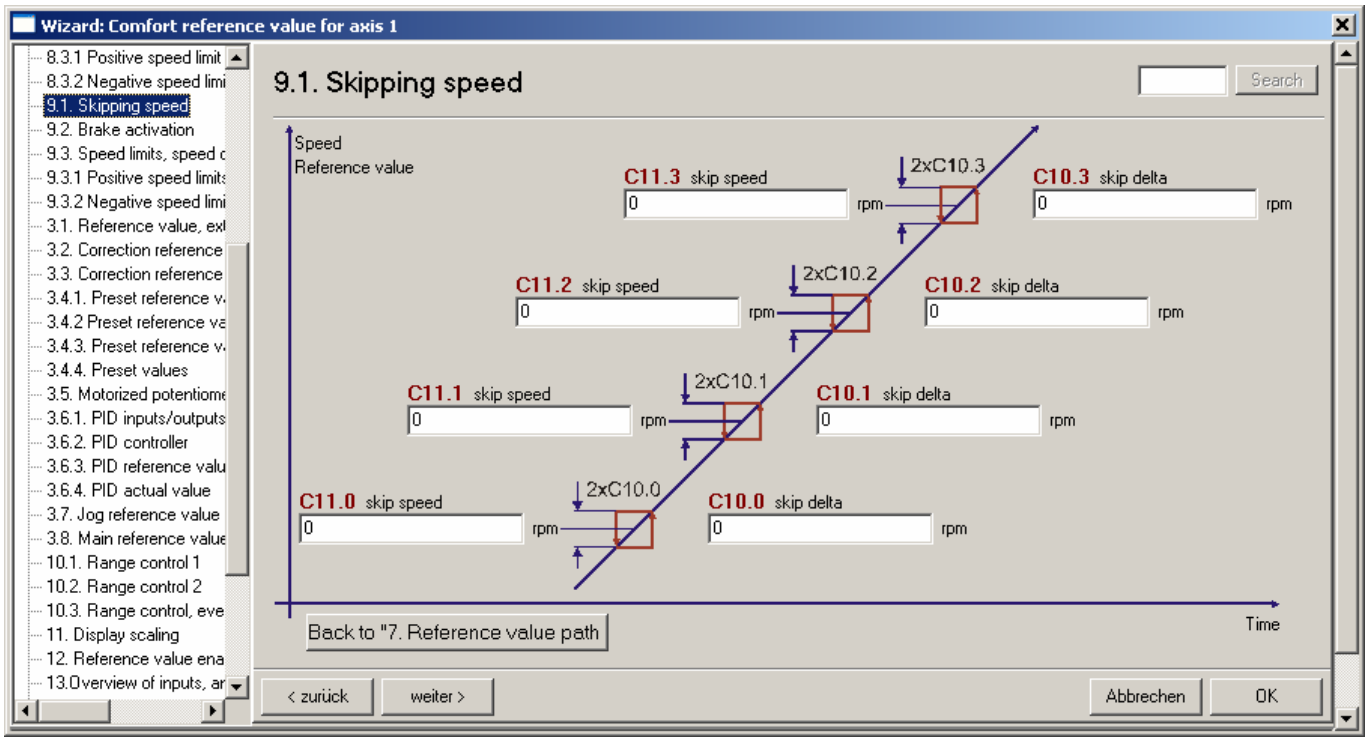

Figure 9-1 Setting the speed skip

Example

A plant has sympathetic vibration in the speed range from 520 Rpm to 580 Rpm. This results in the parameter **C11**.0 = 550 Rpm and a range of **C10**.0 = 30 Rpm.

Figure 9-2 shows the interrelationship between the reference value progressions for a skipped position. When the reference value reaches the lower speed range (in our example: < 520 Rpm) the lower limit is output until the reference value reaches the upper limit. The drive is then accelerated with the quick stop ramp until it reaches the upper limit (580 Rpm).

With a decreasing reference value the jump occurs in the opposite direction (i.e., the drive is held at the upper limit until the reference value reaches the lower limit).

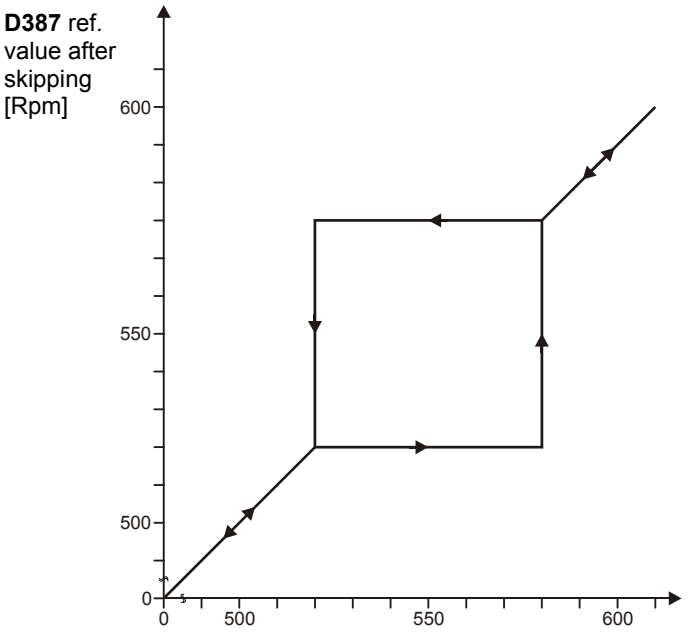

Figure 9-2 Progression of speed skipping

Status signals

Signal	Function	Fieldbus Image	Single Parameter
In area to be skipped	When the signal is high the motor speed is in the area to be skipped (**C10**.X, **C11**.X).	**D201 Bit10**	**D439**

9.2 Brake Activation

How to parameterize brake activation….

The brake is always switched on and off with the system enable **A900**. In this case brake release and brake set times are ignored.

To specify the physical factors of motor and brake, parameterize activation of the brake on page 9.2 of the Assistant (Figure 9-3).
Remember that the screen on page 9.2 depends on the particular control mode which is set (**B20** control mode). The screen shown in Figure 9-3 is the one which appears when a control mode without feedback is parameterized in **B20** (**B20** = *0:V/f control* or *1: sensorless vector control*). If you set a control mode with feedback in **B20** (**B20** = *3:vector control* or *64:servo control*), the parameters **F01** and **F02** do not appear on page 9.2 and the characteristic curves are different.

The brake activation as you parameterized it on page 9.2 is triggered with the system enable **A900**, a stop (signal source set in **D102** stop source) or a quick stop (signal source set in **A62** quick stop source).

To parameterize proceed as described below:

- Activate brake activation in parameter **F08**. In the setting *1:active* the current motor torque is stored when the brake closes. This torque is re-established when the brake opens again. When **F08** is set to *2:do not save torque* only the motor magnetization (flux) is established when the brake opens.
- Enter the speed in **F02** at which the brake is to be applied.
- Enter the speed in **F01** at which the brake is to be released.
- Enter the time in **B27** during which the motor is to remain magnetized (in flux) after the brake procedure is triggered.
- Enter the percentage of the halt flux in **B25** which is to be maintained after the time in **B27**.
- Enter the time in **F07** which the brake requires to be applied.
- Enter the time in **F06** which the brake requires to be released.

If you use the motors with brakes from STÖBER ANTRIEBSTECHNIK GmbH & Co. KG, you will find the correct values for **F07** and **F06** in the catalogs.
If you use a servo motor with EnDat® encoder, **F07** and **F06** are automatically read from the electronic nameplate.

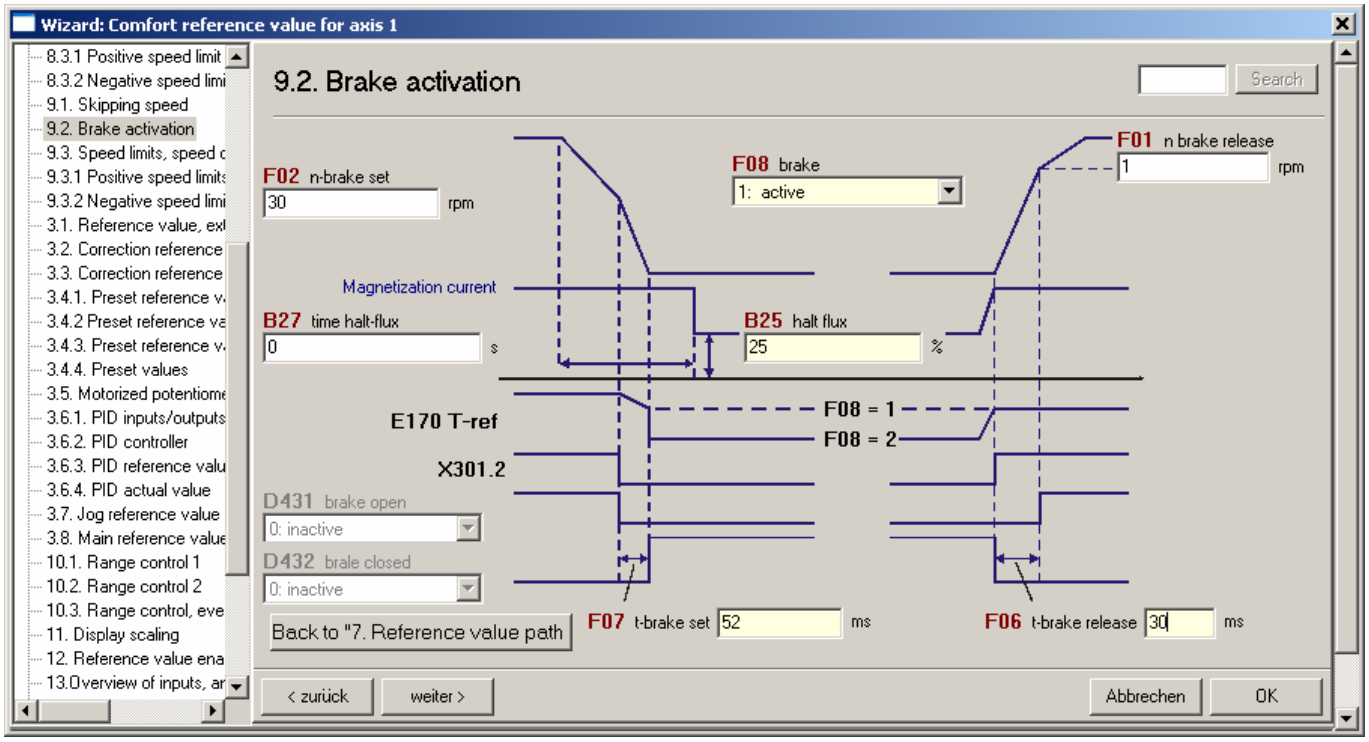

Figure 9-3 Parameterizing brake activation

Status signals

Signal	Function	Fieldbus Image	Single Parameter
Brake open	When the signal is high the brake is open. The signal becomes inactive when the brake begins to close.	**D201 Bit2**	**D431**
Brake closed	The signal is *1:active* when the brake is closed. The parameter becomes *0:inactive* when the brake begins to open.	**D201 Bit3**	**D432**

9.3 Range Control and Display Scaling

Description

The "range control" function gives you an opportunity to monitor a value in data format I16. When the parameter exceeds a user specified limit you you can have an event triggered (message, warning or fault).

There are two range controls available. Go to pages 10.1 und 10.2 of the Assistant to set the control. The following description is based on "range control 1" on page 10.1 of the Assistant (Figure 9-4).

- Enter the parameter in **D60** which you want to monitor. Remember that this parameter must be in data format I16. If you want to monitor an I32-format parameter you can scale it to the I16 format with "display scaling." For more information read the following sections.
- Enter a factor in **D61** with which the parameter is to be weighted.
  Remember that an entry of 25% corresponds to the factor 1 since a further multiplication with the factor 4 takes place internally.
- Enter the time constant of the low pass in **D62**. The low pass smoothes the progression of the value to be monitored. The result after smoothing is indicated in **D69**.
- Specify in **D63** how the value indicated in **D69** is to be monitored. When **D63** is set to *0:range* the limits **D64** to **D67** are evaluated unchanged. When **D64** = -50% and **D67** = 60% are parameterized the valid working range is between -50% and 60% in this case. With *1:absolute* the limits specified in **D64** to **D67** are evaluated symmetrically to zero. When **D64** = 50% and **D67** = 60% are parameterized the valid working range is between +50% and +60% or -60% and -50%.
- Enter the limits of the control in **D64** to **D67**.
  D64 determines the lowest limit of range control. When the value in **D69** passes below this limit **D190** is active and event 60 is triggered.
  D65 determines the first lower limit of range control. When this limit is passed below **D191** indicates and signals that the value in **D69** is approaching the critical limit **D64**. When the value in **D69** is between **D65** and **D66** this is indicated by **D192**.
  D66 determines the first upper limit of range control. When this limit is exceeded **D193** indicates and signals that the value in **D69** is approaching the critical limit **D67**.
  D67 determines the highest upper limit of range control. When the value in **D69** exceeds this limit **D194** is active and event 61 is triggered.
- Specify in **D68** whether control range is limited to static operation. When *0:inactive* is parameterized range control is not performed during accelerations or disabled drive. Event signals **D190** to **D194** are set to *0:inactive*. When **D68** is parameterized to *1:active* range control is performed continuously and **D190** to **D194** are set accordingly.

Range control 2 on page 10.2 of the Assistant is parameterized as described here.

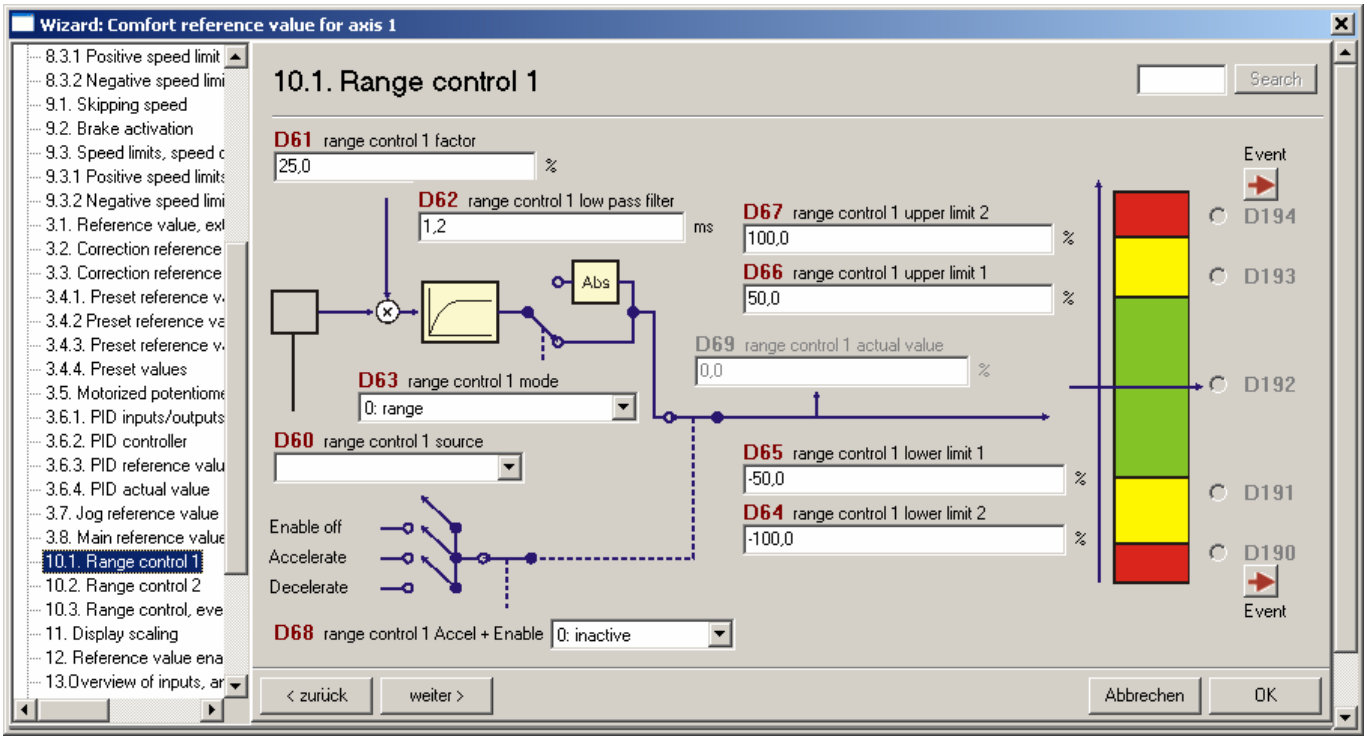

Figure 9-4 Setting range control

How to parameterize the events …

Go to page 10.3 of the Assistant (Figure 9-55) to parameterize the events. The level of the events is set in **U100** or **U110** for range control 1 and in **U120** or **U130** for range control 2. You can select from the following settings.

- When *0:inactive* is set an exceeded limit has no reaction.
- With all other settings a parameter is indicated in which you can enter a designation. This designation is shown on the inverter's display when the event is triggered.
- When *1:message* is parameterized the choosen designation is shown on the display. Operation is continued.
- When *2:warning* is set a parameter is indicated in which you enter a time. When the event occurs operation is continued for this time. The event is indicated on the display. After this time expires the warning is converted into a fault. The inverter switches to the device state "fault."
- When you parameterize *3:fault* the inverter changes immediately to the device state "fault" when a limit is violated.

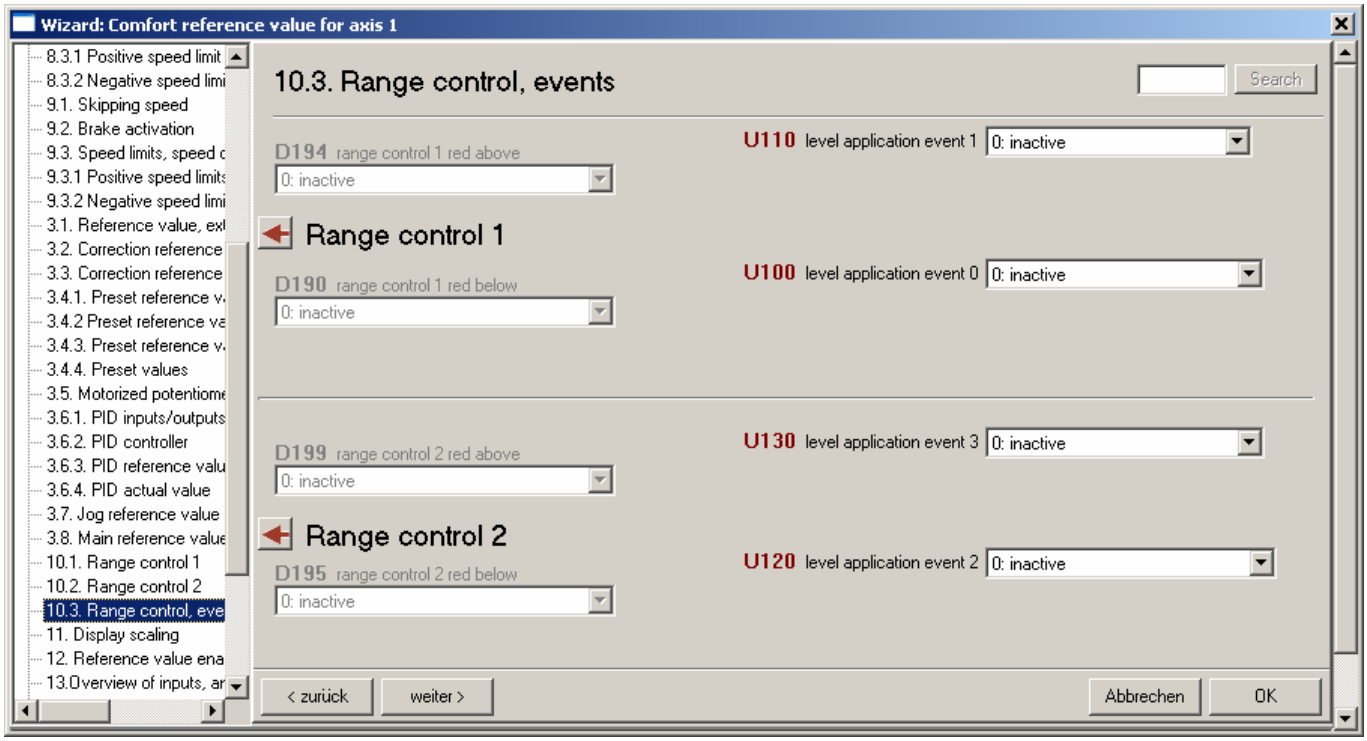

Figure 9-5 Parameterizing the events for range control

How to scale I32 values to I16 format …

Parameters **D98**.X and **D99**.X can be used to scale I32 parameters, which are shown in user units, to I16 values in relation to **D56**. Go to page 11 of the Assistant and proceed as described below (Figure 9-6):

- Enter the I32 parameter in **D98**.X.
- The value scaled in I16 can be read out in the same element in array **D99**.X. This value can then be entered in the "range control" function.

Scaling can also be used to indicate I32 values on analog outputs.

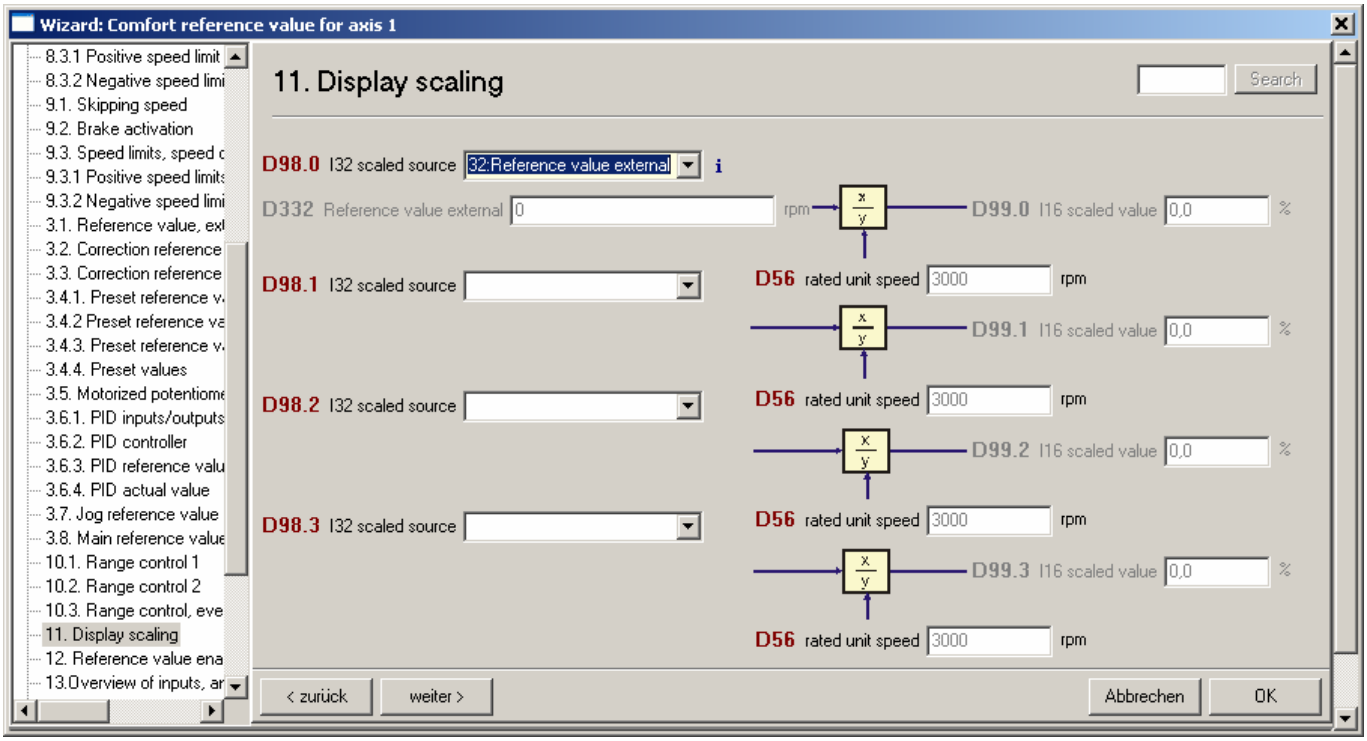

Figure 9-6 Parameterizing the scaling

Status signals

Signal	Function	Fieldbus Image	Single Parameter
Range control 1, red, below	The signal is *1:active* when the value indicated in **D69** is below the limit entered in **D64** (**D69** < **D64**).	**D202 Bit0**	**D190**
Range control 1, yellow, below	The signal is *1:active* when the value indicated in **D69** is between the values **D64** and **D65** (**D64** < **D69** < **D65**).	**D202 Bit1**	**D191**
Range control 1, green	The signal is *1:active* when the value indicated in **D69** is between the values **D65** and **D66** (**D65** < **D69** < **D66**).	**D202 Bit2**	**D192**
Range control 1, yellow, above	The signal is *1:active* when the value indicated in **D69** is between the values **D66** and **D67** (**D66** < **D69** < **D67**).	**D202 Bit3**	**D193**
Range control 1, red, above	The signal is *1:active* when the value indicated in **D69** is above the limit entered in **D67** (**D69** > **D67**).	**D202 Bit4**	**D194**
Range control 2, red, below	The signal is *1:active* when the value indicated in **D79** is below the limit entered in **D74** (**D79** < **D74**).	**D202 Bit5**	**D195**
Range control 2, yellow, below	The signal is *1:active* when the value indicated in **D79** is between the values **D74** and **D75** (**D74** < **D79** < **D75**).	**D202 Bit6**	**D196**
Range control 2, green	The signal is *1:active* when the value indicated in **D79** is between the values **D75** and **D76** (**D75** < **D79** < **D76**).	**D202 Bit7**	**D197**
Range control 2, yellow, above	The signal is *1:active* when the value indicated in **D79** is between the values **D76** and **D77** (**D76** < **D79** < **D77**).	**D202 Bit8**	**D198**
Range control 2, red, above	The signal is *1:active* when the value indicated in **D79** is above the limit entered in **D77** (**D79** > **D77**).	**D202 Bit9**	**D199**

9.4 Reference Value Enable

Description

The reference values "external reference value," "correct ref1 and 2," "jog ref value," "PID ref value" and "PID actual value" generate a reference value enable. Go to page 12 of the Assistant to activate the evaluation of the reference value enable in **D55** (Figure 9-7).

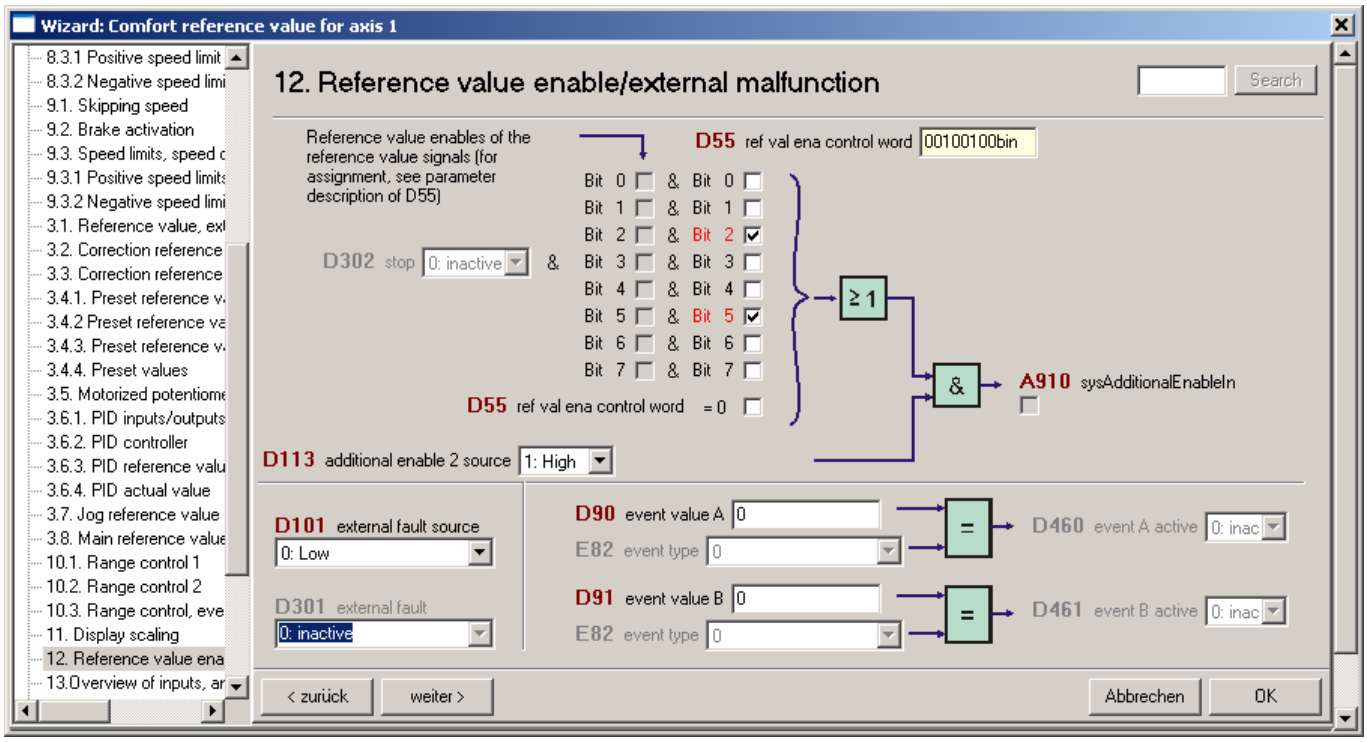
Wizard: Comfort reference value for axis 1
12. Reference value enable/external malfunction
Search
Reference value enables of the reference value signals (for assignment, see parameter description of D55)
D55 ref val ena control word 00100100bin
Bit 0 & Bit 0
Bit 1 & Bit 1
Bit 2 & Bit 2
Bit 3 & Bit 3
Bit 4 & Bit 4
Bit 5 & Bit 5
Bit 6 & Bit 6
Bit 7 & Bit 7
D302 stop 0: inactive &
≥ 1
&
A910 sysAdditionalEnableIn
D55 ref val ena control word = 0
D113 additional enable 2 source 1: High
D101 external fault source
0: Low
D301 external fault
0: inactive
D90 event value A 0
E82 event type 0
=
D460 event A active 0: inac
D91 event value B 0
E82 event type 0
=
D461 event B active 0: inac
< zurück
weiter >
Abbrechen
OK
8.3.1 Positive speed limit
8.3.2 Negative speed limi
9.1. Skipping speed
9.2. Brake activation
9.3. Speed limits, speed c
9.3.1 Positive speed limits
9.3.2 Negative speed limi
3.1. Reference value, exl
3.2. Correction reference
3.3. Correction reference
3.4.1. Preset reference v
3.4.2 Preset reference va
3.4.3. Preset reference v
3.4.4. Preset values
3.5. Motorized potentiome
3.6.1. PID inputs/outputs
3.6.2. PID controller
3.6.3. PID reference valu
3.6.4. PID actual value
3.7. Jog reference value
3.8. Main reference value
10.1. Range control 1
10.2. Range control 2
10.3. Range control, eve
11. Display scaling
12. Reference value ena
13.Overview of inputs, ar

Figure 9-7 Parameterizing the reference value enable

The reference value enables to be used are activated by individual bit:

Bit in D55	Enable of the Reference Value
Bit 0	Reference value external
Bit 1	Correct ref1
Bit 2	Correct ref2
Bit 3	Jog ref value
Bit 4	PID ref value
Bit 5	PID actual value

The enable of a reference value is active when the applicable bit is active in **D55** and the reference value has reached the value in the related parameter **51**.X. The reference value enable is AND-linked with the signal *AdditionalEnable 2* (selector **D113**, indication **D313**). When both signals are active the device enable can be given together with the hardware enable on X1.

You can use several reference value enables at the same time. If you do, at least one of the reference value enables must be active.

9.5 Events

Description

The Comfort Reference Value application allows you to:

- trigger an inverter malfunction with an external signal and
- indicate the occurrence of an event.

External triggering of a malfunction

Go to page 12 of the Assistant (Figure 9-7) to parameterize the triggering of an event. Set the signal source in **D101**. You can choose between fieldbus and binary input.

External malfunction:
`Fault`
`44:Text from U180`
	Trigger: Application event
	Level: Malfunction
	Acknowledgment: Switch device off/on or programmed acknowledgment
	Other: Should only be used for application events which may not be set lower than "malfunction" level.
	Event counter: **Z44**

Indicate a certain event

You can indicate the occurrence of two different events (from **E82** event type). Enter the event to be monitored in **D90** or **D91**. The parameters are located on page 12 of the Assistant (Figure 9-7). You will find the number of the event in the event table in chapter 4 of the application manual. When the event is determined in **E82** parameter **D460** or **D461** is set to *1:active*.

Example:
When the permissible maximum torque for operation is exceeded, an indication is to be made in BA1.

Solution:
Enter the value 47 in **D90**. Event 47 shows that the permissible maximum torque has been exceeded.
Enter the coordinates **D460** in **F61**.
This causes the occurrence of fault 47 to be indicated at BA1.

Signal	Function	Fieldbus Image	Single Parameter
External malfunction	A high level means that an external signal for triggering a malfunction is queued.	**D202 Bit10**	**D301**
Event value A	When the level is high the event entered in **D90** has occurred.	**D202 Bit11**	**D460**
Event value B	When the level is high the event entered in **D91** has occurred.	**D202 Bit12**	**D461**

10 FIELDBUS

Information that you will in this chapter …

This chapter shows you how to implement a fieldbus coupling for the "Comfort Reference Value" application. When you connect a fieldbus, be sure to:

- select the appropriate device controller in the configuration assistant,
- install the appropriate option board if you are using CAN, PROFIBUS DP or EtherCAT and
- configure the option in the configuration assistant.

You will be provided with an assistant in the global sector for the configured fieldbus. You can access the fieldbus parameters such as bus address or mapping parameters with this assistant.

The control and status words

You can write binary signals to the inverter in the "Comfort Reference Value" application via the control words:

- **A180** device control byte,
- **D210** speed reference value control word,
- **D211** speed reference value control word 2 or
- **D212** speed reference value control word 3.

You can specify in the selector of a signal whether the signal is to be written via a binary input or fieldbus. If you use transmission via fieldbus, set *2:parameter* in the selector. The description of the selector tells you which control word and which bit has to be written.

The following parameters are available as status words.

- **E200** device status byte,
- **D200** speed reference value status word,
- **D201** speed reference value status word 2 and
- **D202** speed reference value status word 3.

You do not have to allocate the status words to bits like you do for the control words. The signals are automatically written to the bits.

In online mode you can monitor the control and status words on pages 17 to 20 of the "Comfort Reference Value" assistant.

When you connect a CAN bus

The CAN fieldbus interface provides you with the following:

- Two PDO channels (tx / rx).
- One SDO channel (tx / rx).
- If necessary, three additional SDO channels (tx / rx).

Cf. CANopen documentation, impr.-no. 441684.

When you connect a PROFIUS DP

The PROFIBUS DP fieldbus interface provides you with the following:

- GSD file
- PPO 1: 4 PKW, 2 PZD
- PPO 2: 4 PKW, 6 PZD
- PPO 3: 0 PKW, 2 PZD
- PPO 4: 0 PKW, 6 PZD
- PPO 5: 4 PKW, 10 PZD
- Support of the DP-V1 protocol

Cf. PROFIBUS DP documentation, impr.-no. 441685.

When you connect an EtherCAT fieldbus

The EtherCAT fieldbus interface provides you with the following:

- Two PDO channels (tx / rx).
- One SDO channel (tx / rx).

Cf. EtherCAT documentation, publ.-no. 441896.

11 USED PARAMETERS

11.1 Parameter legend

Par.	Description	Fieldbus address	
C230 Global r=2, w=2	**Torque limit:** Specification for the torque limit (absolute value) via fieldbus if the signal source is **C130**=*4:Parameter*. *Value range in %: -200 to 200 to 200* Fieldbus: 1LSB=1 %; PDO ; type: I16; (raw value:32767 = 200 %); USS address: 03 39 80 00 hex	24E6h	0h

Global – Parameter is not dependent on axis.
Achse – Parameter is axis-specific.
Off – Parameter can only be changed when enable is off.

Value range:
Specification of unit, minimum and maximum value
The default setting is underlined.

PROFIBUS = PNU (PKW1)
CAN-Bus = Index

PROFIBUS = Subindex
CAN-Bus = Subindex

Access level for read (r=2) and write accesses (w=2)

Fieldbus:
1st position: Scaling for integer (PROFIBUS and CAN bus)
2nd position: - PDO – Parameters can be imaged as process data.
- Blank – Parameter can only be accessed via PKW (PROFIBUS) or SDO (CAN bus).
3rd position: Data type. See application manual, chapter 3.2.
4th position: Scaling for raw values
5th position: USS address

11.2 Parameter list

A.. Inverter

Par.	Description	Fieldbus-address	
A00.0 Global r=0, w=0	**Save values & start:** When this parameter is activated, the inverter saves the current configuration and the parameter values in the Paramodule. After power-off, the inverter starts with the saved configuration. If the configuration data on the inverter and Paramodul are identical, only the parameters are saved (speeds up the procedure). **NOTE** Do not turn off the power of the control section (device version /L:24 V, device version /H: supply voltage) while the action is being executed. If the power is turned off while the action is running this causes incomplete storage. After the device starts up again the fault "*ConfigStartERROR parameters lost" appears on the display. Only several 1000 storage procedures are possible per Paramodul. When this limit has almost been reached, result 14 is indicated after the storage procedure. When this happens, replace Paramodul as soon as possible. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 00 00 00 hex	2000h	0h
A00.1 Global read (0)	**Process:** Shows the progress of the "save vales" action in %. Fieldbus: 1LSB=1%; Type: U8; USS-Adr: 01 00 00 01 hex	2000h	1h
A00.2 Global read (0)	**Result:** Result of the "save values" action *0: error free;* *10: write error;* *11: invalid data;* *12: write error;* *14: warning;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 00 00 02 hex	2000h	2h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A10.0 Global r=0, w=0	**Userlevel:** Specifies the access level of the user for the parameters via the "Display" communication path. Each parameter has one level for read or write accesses. A parameter can only be read or changed with the necessary access level. The higher the set level the more parameters can be accessed. Possible settings: *0: Monitor;* The elementary indicators can be monitored. General parameters can be changed. *1: Standard;* The primary parameters of the selected application can be monitored and changed. *2: Extended;* All parameters for commissioning and optimization of the selected application can be monitored and changed. *3: Service;* Service parameters. Permit a comprehensive diagnosis. *Value range: -32768 ... 1 ... 32767* Fieldbus: 1LSB=1; Type: I16; USS-Adr: 01 02 80 00 hex	200Ah Array	0h
A10.1 Global r=0, w=0	**Userlevel:** Specifies the access level of the user for the parameters via the RS232 (X3) communication path. Each parameter has one level each for read or write accesses. A parameter can only be read or changed with the necessary access level. The higher the set level the more parameters can be accessed. Possible settings: *0: Monitor;* The elementary indicators can be monitored. General parameters can be changed. *1: Standard;* The primary parameters of the selected application can be monitored and changed. *2: Extended;* All parameters for commissioning and optimization of the selected application can be monitored and changed. *3: Service;* Service parameters. Permit a comprehensive diagnosis. *Value range: -32768 ... 3 ... 32767* Fieldbus: 1LSB=1; Type: I16; USS-Adr: 01 02 80 01 hex	200Ah Array	1h
A10.2 Global r=0, w=0	**Userlevel:** Specifies the access level of the user for the parameters via the CAN-bus (SDO) communication path. Each parameter has one level each for read or write accesses. A parameter can only be read or changed with the necessary access level. The higher the set level the more parameters can be accessed. Possible settings: *0: Monitor;* The elementary indicators can be monitored. General parameters can be changed. *1: Standard;* The primary parameters of the selected application can be monitored and changed. *2: Extended;* All parameters for commissioning and optimization of the selected application can be monitored and changed. *3: Service;* Service parameters. Permit a comprehensive diagnosis. *Value range: -32768 ... 3 ... 32767* Fieldbus: 1LSB=1; Type: I16; USS-Adr: 01 02 80 02 hex	200Ah Array	2h
A10.3 Global r=0, w=0	**Userlevel:** Specifies the access level of the user for the parameters via the PROFIBUS communication path with the PKW0 or PKW1 protocol. Each parameter has one level each for read or write accesses. A parameter can only be read or changed with the necessary access level. The higher the set level the more parameters can be accessed. Possible settings: *0: Monitor;* The elementary indicators can be monitored. General parameters can be changed. *1: Standard;* The primary parameters of the selected application can be monitored and changed. *2: Extended;* All parameters for commissioning and optimization of the selected application can be monitored and changed. *3: Service;* Service parameters. Permit a comprehensive diagnosis. *Value range: -32768 ... 3 ... 32767* Fieldbus: 1LSB=1; Type: I16; USS-Adr: 01 02 80 03 hex	200Ah Array	3h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A10.4 Global r=0, w=0	**Userlevel:** Specifies the access level of the user for the parameters via the "system bus" communication path. Each parameter has one level each for read or write accesses. A parameter can only be read or changed with the necessary access level. The higher the set level the more parameters can be accessed. Possible settings: *0: Monitor;* The elementary indicators can be monitored. General parameters can be changed. *1: Standard;* The primary parameters of the selected application can be monitored and changed. *2: Extended;* All parameters for commissioning and optimization of the selected application can be monitored and changed. *3: Service;* Service parameters. Permit a comprehensive diagnosis. *Value range: -32768 ... 3 ... 32767* Fieldbus: 1LSB=1; Type: I16; USS-Adr: 01 02 80 04 hex	200Ah Array	4h
A11.0 Global r=1, w=1	**Edited Axe:** Specifies the axis to be edited via device display. Axis to be edited (**A11**) and active axis (operating indicator, **E84**) must not be identical (e.g., axis 1 can be edited while the inverter continues with axis 2). *Value range: 0 ... 0: axis 1 ... 3* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 02 C0 00 hex	200Bh Array	0h
A11.1 Global r=1, w=1	**Edited Axe:** Selects the axis to be parameterized which is addressed with CANopen with SDO channel 1 or with PROFIBUS DP-V0. The axis to be edited (**A11**) and the active axis (operation indicator, **E84**) must not be identical (e.g., axis 1 can be edited while the inverter continues with axis 2). With PROFIBUS DP-V0, a distinction can be made between two axes with the PKW service. Axis 1 or axis 2 is selected with **A11**.1=0. Axis 3 or axis 4 is selected with **A11**.1=1. *Value range: 0 ... 0: axis 1 ... 3* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 02 C0 01 hex	200Bh Array	1h
A11.2 Global r=1, w=1	**Edited Axe:** Selects the axis to be parameterized which is addressed with CANopen with SDO channel 2. The axis to be edited (**A11**) and the active axis (operation indicator, **E84**) must not be identical (e.g., axis 1 can be edited while the inverter continues with axis 2). *Value range: 0 ... 0: axis 1 ... 3* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 02 C0 02 hex	200Bh Array	2h
A11.3 Global r=1, w=1	**Edited Axe:** Selects the axis to be parameterized which is addressed with CANopen with SDO channel 3. The axis to be edited (**A11**) and the active axis (operation indicator, **E84**) must not be identical (e.g., axis 1 can be edited while the inverter continues with axis 2). *Value range: 0 ... 0: axis 1 ... 3* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 02 C0 03 hex	200Bh Array	3h
A11.4 Global r=1, w=1	**Edited Axe:** Selects the axis to be parameterized which is addressed with CANopen with SDO channel 4. The axis to be edited (**A11**) and the active axis (operation indicator, **E84**) must not be identical (e.g., axis 1 can be edited while the inverter continues with axis 2). *Value range: 0 ... 0: axis 1 ... 3* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 02 C0 04 hex	200Bh Array	4h
A12 Global r=1, w=1	**Language:** Language on the display. *0: German/primary language;* *1: English/secondary language;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 03 00 00 hex	200Ch	0h
A21 Global, OFF r=1, w=2	**Brake resistor R:** Resistance value of the brake resistor being used. *Value range in Ohm: 200.0 ... 300,0 ... 600.0* Fieldbus: 1LSB=0,1Ohm; Type: I16; USS-Adr: 01 05 40 00 hex	2015h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A22 Global, OFF r=1, w=2	**Brake resistor P:** Power of the brake resistor used. **A22**=0 means the brake chopper is deactivated. Only values in 10 W increments can be entered. *Value range in W: 0 ... 150 ... 3200* Fieldbus: 1LSB=1W; Type: I16; (raw value:1LSB=10·W); USS-Adr: 01 05 80 00 hex	2016h	0h
A23 Global, OFF r=1, w=2	**Brake resistor thermal:** Thermal time constant of the brake resistor. *Value range in s: 1 ... 46 ... 2000* Fieldbus: 1LSB=1s; Type: I16; USS-Adr: 01 05 C0 00 hex	2017h	0h
A29 Global r=2, w=2	**Fault quick-stop:** If the parameter is inactive, the power section is turned off when a fault occurs. The motor coasts down. If the parameter is active, a quick stop is executed when a fault occurs if the event permits (see event list). *0: inactive;* Coast down (disable power section immediately). *1: active;* Execute quick stop. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 07 40 00 hex	201Dh	0h
A34 Global r=2, w=2	**Auto-start:** When **A34**=1 is set, the device state *"switch-on disable"* to *"ready for switch-on"* is exited both during first startup and after a fault reset although the enable is active. With fault reset via enable, this causes an immediately restart! **A34** is only supported with standard device state machines and not with DSP402 device state machine. **WARNING** Before activation of auto-start with **A34**=1, check to determine whether an automatic restart is allowed (for safety reasons). Only use auto-start under consideration of the standards and regulations which are applicable to the plant or machine. *0: inactive;* After power on, a change of the enable from L-level to H-level is necessary to enable the drive (→ message "*1:switch-on disable*"). This prevents an undesired startup of the motor (machine safety). *1: active;* If auto-start is active, the drive can start running immediately after power on and existing enable. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 08 80 00 hex	2022h	0h
A35 Global, OFF r=2, w=2	**Low voltage limit:** When the inverter is enabled and the DC link voltage goes lower than the value set here, the inverter triggers the indication of the event "*46:Low voltage*." **A35** should be approximately 85% of the applied power voltage so that the possible failure of a network phase is absorbed. *Value range in V: 180.0 ... 350,0 ... 570.0* Fieldbus: 1LSB=0,1V; Type: I16; USS-Adr: 01 08 C0 00 hex	2023h	0h
A36 Global, OFF r=2, w=2	**Mains voltage:** Maximum voltage which the inverter provides to the motor. Usually the power (mains) voltage. Starting with this voltage, the motor runs in the weak field range. *Value range in V: 220 ... 400 ... 480* Fieldbus: 1LSB=1V; Type: I16; (raw value:32767 = 2317 V); USS-Adr: 01 09 00 00 hex	2024h	0h
A37.0 Global r=2, w=2	**Reset memorized values & start:** The six different memorized values **E33** to **E38** (max. current, max. temperature, and so on) are reset. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 09 40 00 hex	2025h	0h
A37.1 Global read (2)	**Process:** Progress of the reset-memorized-values action in %. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 09 40 01 hex	2025h	1h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A37.2 Global read (2)	**Result:** After conclusion of the reset-memorized-values action, the result can be queried here. *0: error free;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 09 40 02 hex	2025h	2h
A38 Global r=2, w=2	**DC power-input:** This parameter is used to set whether the inverter is to be exclusively supplied with DC voltage via the DC link. Read and adhere to the chapter "DC Link Coupling" in the Mounting Instructions for MDS 5000 (publication no. 441688) and FDS 5000 (publication no. 441858). Groups 2 and 3 are exclusively powered via the DC link. Set **A38 =** *1:active* for these inverters. Set **A38 =** *1:inactive* for group 1 inverters. If you do not set a DC link coupling at all, always set parameter **A38** to *0:inactive*. *0: inactive;* Inverter is powered by the three-phase network. *1: active;* Inverter is powered with direct current exclusively via the terminals *U+* and *U-* (size 0 to size 2) or *ZK+* and *ZK-* (MDS size 3). Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 09 80 00 hex	2026h	0h
A39 Global r=2, w=2	**t-max. quickstop:** Maximum time available to a quick stop during enable=LOW or in the device state *"fault reaction active."* After this time expires, the motor is de-energized (**A900** = low). This switch-off also occurs even when the quick stop has not yet been concluded. *Value range in ms: 0 ... 400 ... 32767* Fieldbus: 1LSB=1ms; Type: I16; USS-Adr: 01 09 C0 00 hex	2027h	0h
A41 Global read (1)	**Axis-selector:** Indicates the selected axis. The selected axis does not have to be the active axis. *0: Axis 1;* *1: Axis 2;* *2: Axis 3;* *3: Axis 4;* *4: inactive;* The last selected axis was axis 1. *5: inactive;* The last selected axis was axis 2. *6: inactive;* The last selected axis was axis 3. *7: inactive;* The last selected axis was axis 4. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0A 40 00 hex	2029h	0h
A44 Global r=2, w=3	**Enable quick-stop:** If the parameter is inactive, the power pack is turned off immediately when enable=LOW. The motor coasts down. When **A44** is active, a quick stop is executed when enable=LOW. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0B 00 00 hex	202Ch	0h
A45 Global r=2, w=2	**Quickstop end:** When this parameter is set to "*0:Standstill,*" the quick stop ends with standstill. With the setting "*1:No stop*," the quick stop ends when the quick stop request is deleted. *0: standstill;* *1: no stop;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0B 40 00 hex	202Dh	0h
A55 Global r=2, w=3	**Key hand function:** With **A55**=1, the "HAND" key is enabled for turning *local mode* on/off. During local mode, the device enable is granted with the "I/O" key. Local mode is indicated on the display with an "**L**" at the bottom right. The arrow keys on the operator panel can be used to traverse with the drive enabled with "I/O." The speed reference value is calculated during speed mode from **A51**. In positioning applications, this corresponds to the hand speed **I12**. **NOTE** In local mode the regular enable via terminals or from the fieldbus is ignored! *0: inactive;* - key has no function. *1: active;* - key enabled for activation of local mode. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0D C0 00 hex	2037h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A60 Global, OFF r=1, w=1	**Additional enable source:** The *additional enable* signal functions the same as the *enable* signal on terminal X1. Both signals are AND linked. The power end state of the inverter is only enabled when both signals are HIGH. The **A60** parameter specifies where the *additional enable* signal comes from. The selection *"1:High"* has the same meaning as a fixed value. With **A60**=*1:High,* only the enable via the terminal is active. With **A60**=*3:BE1 ... 28:BE13-inverted*, the additional enable is fed by the respective binary input (either direct or inverted). With **A60**=*2:Parameter,* the signal comes from bit 0 in parameter **A180 Device Control Byte** (global parameter). *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0F 00 00 hex	203Ch	0h
A61 Global, OFF r=1, w=1	**Fault reset source:** The *fault reset* signal triggers a fault reset. If the inverter has a malfunction, a change from LOW to HIGH resets this fault. The fault reset is not possible as long as **A00** Save values is active or the cause of the fault still exists. Remember that not every fault can be acknowledged. The **A61** parameter specifies where the *fault reset* signal comes from. With *"0:Low"* and *"1:High,"* a fault reset is only possible with the <ESC> key at the device operator panel or with a LOW-HIGH-LOW change of the enable. With **A61**=*3:BE1 ... 28:BE13-inverted,* faults can be reset via the selected binary input. With **A61**=*2:Parameter*, the signal comes from bit 1 of parameter **A180 Device Command Byte** (global parameter). *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;*	203Dh	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
	14: BE6-inverted; *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0F 40 00 hex		
A62 Global, OFF r=1, w=1	**Quick stop source:** The quick stop signal triggers a quick stop of the drive. With positioning mode, the acceleration specified in **I17** determines the braking time. When the axis is in speed mode, the **D81** parameter determines the braking time. (See also **A39** and **A45**.) The **A62** parameter specifies where the signal is coming from which causes the quick stop. *"0:Low*" means that no quick stop is executed. *"1:High"* means that the drive is permanently in quick stop mode. With **A62**=*3:BE1 ... 28:BE13-inverted,* the quick stop is triggered by the selected binary input. With **A62**=*2:Parameter,* **A180** bit 2 is used as the signal source (global parameter). *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0F 80 00 hex	203Eh	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A63 Global, OFF r=1, w=1	**Axis selector 0 source:** There are 2 "axis selector 0/1" signals with which one of the max. of 4 axes are selected in binary coding. The **A63** parameter specifies where bit 0 for the axis selection is coming from. The possible selections *"0:Low"* and *"1:High"* are the same as fixed values. With **A63**=*0:Low,* the bit is set permanently to 0. With **A63**=*1:High,* it is permanently set to 1. With **A63**=*3:BE1 ... 28:BE13-inverted,* the axis selection can be made via the selected binary input. With **A63**=*2:Parameter,* **A180**, bit 3 is used as the signal source (global parameter). **NOTE** - Axis switchover only possible with "enable off" - With the FDS 5000, the axes can only be used as parameter records for a motor. The POSISwitch® AX 5000 option cannot be connected. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 0F C0 00 hex	203Fh	0h
A64 Global, OFF r=1, w=1	**Axis selector 1 source:** There are 2 "axis selector 0/1" signals with which one of the max. of 4 axes are selected in binary coding. The **A64** parameter specifies where bit 0 for the axis selection is coming from. The possible selections *"0:Low"* and *"1:High"* are the same as fixed values. With **A64**=*0:Low,* the bit is set permanently to 0. With **A64**=*1:High,* it is permanently set to 1. With **A64**=*3:BE1 ... 28:BE13-inverted,* the axis selection can be made via the selected binary input. With **A64**=*2:Parameter,* **A180**, bit 4 is used as the signal source (global parameter). **NOTE** - Axis switchover only possible with "enable off" - With the FDS 5000, the axes can only be used as parameter records for a motor. The POSISwitch® AX 5000 option cannot be connected. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;*	2040h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
	9: BE4; *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 10 00 00 hex		
A65 Global, OFF r=1, w=1	**Axis disable source:** The axis-disable signal deactivates all axes. The **A65** parameter specifies where the signal comes from. With **A65**=*3:BE1 ... 28:BE13-inverted,* axis selection can be handled with the selected binary input. With **A65**=*2:Parameter*, **A180**, bit 5 is the signal source (global parameter). **NOTE** - Axis switchover only possible with "enable off" - With the FDS 5000, the axes can only be used as parameter records for a motor. The POSISwitch® AX 5000 option cannot be connected. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 10 40 00 hex	2041h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A80 Global r=2, w=2	**Serial address:** Specifies the address of the inverter for serial communication via X3 with POSITool or another USS master. *Value range: 0 ... <u>0</u> ... 31* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 14 00 00 hex	2050h	0h
A81 Global r=1, w=1	**Serial baudrate:** Starting with V 5.1, writing to **A81** no longer changes the baud rate immediately but now not until after device OFF-ON (previously with **A00** save values) or **A87** activate serial baud rate = 1 (activate baud rate). This makes the reaction identical to that of the fieldbuses. *0: 9600 Baud*; *1: 19200 Baud*; *2: 38400 Baud*; *<u>3: 57600 Baud</u>*; *4: 115200 Baud*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 14 40 00 hex	2051h	0h
A82 Global r=0, w=0	**CAN baudrate:** Setting of the baud rate with which the CAN-Bus will be operated. Cf. CAN-Bus supplementary documentation, publ. no. 441686. *0: 10 kBit/s;* *<u>1</u>: 20 kBit/s;* *2: 50 kBit/s;* *3: 100 kBit/s;* *4: 125 kBit/s;* *<u>5: 250 kBit/s</u>;* *6: 500 kBit/s;* *7: 800 kBit/s;* *8: 1000 kBit/s*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 14 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	2052h	0h
A83 Global r=0, w=0	**Busaddress:** Specifies the device address for operation with fieldbus. **A83** has no effect on communication via X3 with POSITool or another USS master. *Value range: 0 ... <u>1</u> ... 125* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 14 C0 00 hex	2053h	0h
A84 Global read (0)	**PROFIBUS baudrate:** When operated with a device of the 5th generation of STÖBER inverters with option board "PROFIBUS DP," the baud rate found on the bus is *<u>indicated</u>*. Cf. PROFIBUS supplementary documentation publ. no. 441687. *0: Not found;* *1: 9.6kBit/s;* *2: 19.2kBit/s;* *3: 45.45kBit/s;* *4: 93.75kBit/s;* *5: 187.5kBit/s;* *6: 500 kBit/s;* *7: 1500kBit/s;* *8: 3000kBit/s;* *9: 6000kBit/s;* *10: 12000kBit/s;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 15 00 00 hex 👁 Only visible when a PROFIBUS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming.	2054h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A85 Global read (3)	**PROFIBUS diagnostic:** Indication of internal inverter diagnostic information on the PROFIBUS DP interface. See separate supplementary documentation (publ. no. 441687). Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 15 40 00 hex 👁 Only visible when a PROFIBUS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming.	2055h	0h
A86 Global read (1)	**PROFIBUS configuration:** The inverter offers various ways (PPO types) to transfer cyclic user data via PROFIBUS DP. These can be configured in the GSD file *STOE5005.gsd* on the controller (bus master). This indication parameter can be used to check which of the possible configurations was chosen. 0: No data communication via PROFIBUS started 1: PPO1: 4 PKW, 2 PZD 2: PPO2: 4 PKW, 6 PZD 3: PPO3: 0 PKW, 2 PZD 4: PPO4: 0 PKW, 6 PZD 5: PPO5: 4 PKW, 10 PZD 6: PPO2: 4 PKW, 6 PZD consis. 2 W 7: PPO4: 0 PKW, 6 PZD consis. 2 W 8: PPO5: 4 PKW, 10 PZD consis. 2 W Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 15 80 00 hex 👁 Only visible when a PROFIBUS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming.	2056h	0h
A87 Global r=3, w=3	**Activate serial baudrate:** Starting with V 5.1, writing in **A81** no longer changes the baud rate immediately. The change now takes place only after device OFF/ON or **A87**=1 (activate baud rate). This makes the reaction the same as the reaction of the fieldbuses. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 15 C0 00 hex	2057h	0h
A90.0 Global r=1, w=1	**PZD Setpoint Mapping Rx 1. mapped Parameter:** Address of the parameter which is imaged first from the contents of the process data channel (receiving direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 80 00 hex	205Ah	0h
A90.1 Global r=1, w=1	**PZD Setpoint Mapping Rx 2. mapped Parameter:** Address of the parameter which is imaged second from the contents of the process data channel (receiving direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 80 01 hex	205Ah	1h
A90.2 Global r=1, w=1	**PZD Setpoint Mapping Rx 3. mapped Parameter:** Address of the parameter which is imaged third from the contents of the process data channel (receiving direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 80 02 hex	205Ah	2h
A90.3 Global r=1, w=1	**PZD Setpoint Mapping Rx 4. mapped Parameter:** Address of the parameter which is imaged fourth from the contents of the process data channel (receiving direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 80 03 hex	205Ah	3h
A90.4 Global r=1, w=1	**PZD Setpoint Mapping Rx 5. mapped Parameter:** Address of the parameter which is imaged fifth from the contents of the process data channel (receiving direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 80 04 hex	205Ah	4h
A90.5 Global r=1, w=1	**PZD Setpoint Mapping Rx 6. mapped Parameter:** Address of the parameter which is imaged sixth from the contents of the process data channel (receiving direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 80 05 hex	205Ah	5h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A91.0 Global r=3, w=3	**PZD Setpoint Mapping 2Rx 1. mapped Parameter:** If more parameters are to be imaged than can be specified in **A90**, this parameter offers a possible extension. See **A90**.0. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 C0 00 hex	205Bh	0h
A91.1 Global r=3, w=3	**PZD Setpoint Mapping 2Rx 2. mapped Parameter:** For extension of **A90**, see **A90**.1. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 C0 01 hex	205Bh	1h
A91.2 Global r=3, w=3	**PZD Setpoint Mapping 2Rx 3. mapped Parameter:** For extension of **A90**, See **A90**.2. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 C0 02 hex	205Bh	2h
A91.3 Global r=3, w=3	**PZD Setpoint Mapping 2Rx 4. mapped Parameter:** For extension of **A90**, see **A90**.3. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 C0 03 hex	205Bh	3h
A91.4 Global r=3, w=3	**PZD Setpoint Mapping 2Rx 5. mapped Parameter:** For extension of **A90**, see **A90**.4. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 C0 04 hex	205Bh	4h
A91.5 Global r=3, w=3	**PZD Setpoint Mapping 2Rx 6. mapped Parameter:** For extension of **A90**, see **A90**.5. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 16 C0 05 hex	205Bh	5h
A93 Global read (1)	**PZD Setpoint Len:** Indicator parameter which indicates the length in bytes of the expected process data with reference values (data from PROFIBUS master to inverter) for the current parameterization. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 17 40 00 hex 👁 Only visible when a PROFIBUS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming.	205Dh	0h
A94.0 Global r=1, w=1	**PZD ActValue Mapping Tx 1. mapped Parameter:** Address of the parameter which is imaged first in the contents of the process data channel (sending direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 80 00 hex	205Eh	0h
A94.1 Global r=1, w=1	**PZD ActValue Mapping Tx 2. mapped Parameter:** Address of the parameter which is imaged second in the contents of the process data channel (sending direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 80 01 hex	205Eh	1h
A94.2 Global r=1, w=1	**PZD ActValue Mapping Tx 3. mapped Parameter:** Address of the parameter which is imaged third in the contents of the process data channel (sending direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 80 02 hex	205Eh	2h
A94.3 Global r=1, w=1	**PZD ActValue Mapping Tx 4. mapped Parameter:** Address of the parameter which is imaged fourth in the contents of the process data channel (sending direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 80 03 hex	205Eh	3h
A94.4 Global r=1, w=1	**PZD ActValue Mapping Tx 5. mapped Parameter:** Address of the parameter which is imaged fifth in the contents of the process data channel (sending direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 80 04 hex	205Eh	4h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A94.5 Global r=1, w=1	**PZD ActValue Mapping Tx 6. mapped Parameter:** Address of the parameter which is imaged sixth in the contents of the process data channel (sending direction as seen by the inverter). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 80 05 hex	205Eh	5h
A95.0 Global r=3, w=3	**PZD ActValue Mapping 2Tx 1. mapped Parameter:** When more parameters are to be imaged than can be specified in **A94**, this parameter offers a possible extension. See **A94**.0. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 C0 00 hex	205Fh	0h
A95.1 Global r=3, w=3	**PZD ActValue Mapping 2Tx 2. mapped Parameter:** For extension of **A94**, see **A94**.1. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 C0 01 hex	205Fh	1h
A95.2 Global r=3, w=3	**PZD ActValue Mapping 2Tx 3. mapped Parameter:** For extension of **A94**, see **A94**.2. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 C0 02 hex	205Fh	2h
A95.3 Global r=3, w=3	**PZD ActValue Mapping 2Tx 4. mapped Parameter:** For extension of **A94**, see **A94**.3. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 C0 03 hex	205Fh	3h
A95.4 Global r=3, w=3	**PZD ActValue Mapping 2Tx 5. mapped Parameter:** For extension of **A94**, see **A94**.4. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 C0 04 hex	205Fh	4h
A95.5 Global r=3, w=3	**PZD ActValue Mapping 2Tx 6. mapped Parameter:** For extension of **A94**, see **A94**.5. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 17 C0 05 hex	205Fh	5h
A97 Global read (1)	**PZD ActValue Len:** Indicator parameter which indicates the length in bytes of the current process data with actual values (data from inverter to PROFIBUS master) for the current parameterization. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 18 40 00 hex 👁 Only visible when a PROFIBUS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming.	2061h	0h
A100 Global r=3, w=3	**Fieldbusscaling:** The selection is made here between internal raw values and whole numbers for the representation/scaling of process data values during transmission via PZD channel. Regardless of this setting, the representation is always the whole number via PKW channel and the non cyclic parameter channel. **CAUTION** When *"0:integer"* is parameterized (scaled values), the runtime load increases significantly and it may become necessary to increase **A150** Cycle time to avoid the fault *"57:runtime usage"* or *"35:Watchdog."* With few exceptions, the PKW channel is always transferred in scaled format. *0: integer without point;* Values are transferred as whole number in user units * 10 to the power of the number of positions after the decimal point. *1: native;* Values are transferred at optimized speed in the internal inverter raw format (e.g., increments). Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 19 00 00 hex 👁 Only visible when a PROFIBUS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming.	2064h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A101 Global r=3, w=3	**Dummy-Byte:** This variable is used to replace a piece of process data with the byte length when you want to test deactivation of the process variables via fieldbus. **NOTE** The parameter is only visible when fieldbus device control was selected in the configuration assistant. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 01 19 40 00 hex	2065h	0h
A102 Global r=3, w=3	**Dummy-Word:** This variable is used to replace a piece of process data with the word length when you want to test deactivation of the process variables via fieldbus. **NOTE** The parameter is only visible when fieldbus device control was selected in the configuration assistant. Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 01 19 80 00 hex	2066h	0h
A103 Global r=3, w=3	**Dummy-Doubleword:** This variable is used to replace a piece of process data with the double-word length when you want to test deactivation of the process variables via fieldbus. **NOTE** The parameter is only visible when fieldbus device control was selected in the configuration assistant. Fieldbus: 1LSB=1; PDO ; Type: U32; USS-Adr: 01 19 C0 00 hex	2067h	0h
A109 Global r=1, w=1	**PZD-Timeout:** To keep the inverter from continuing with the last received reference values after a failure of PROFIBUS or the PROFIBUS master, process data monitoring should be activated. The RX block monitors the regular receipt of process data telegrams (PZD) which the PROFIBUS master sends cyclically during normal operation. The **A109** PZD-Timeout parameter is used to activate this monitoring function. A time is set here in milliseconds. The default setting is 65535. This value and also the value 0 mean that monitoring is inactive. This is recommended while the inverter is being commissioned on PROFIBUS and for service and maintenance work. Monitoring should only be activated for the running process during which a bus master cyclically sends process data to the inverter. The monitoring time must be adapted to the maximum total cycle time on PROFIBUS plus a sufficient reserve for possible delays. Sensible values are usually between 30 and 300 msec. When process data monitoring is triggered on the inverter, the fault *"52:communication" is triggered.* * The **A109** PZD-Timeout parameter is also used for communication via USS protocol for the USS-PZD telegram. *Value range in ms: 0 ... 65535 ... 65535* Fieldbus: 1LSB=1ms; Type: U16; USS-Adr: 01 1B 40 00 hex	206Dh	0h
A110.0 Global r=1, w=1	**USS PZD Mapping Rx 1. mapped Parameter:** Address of the parameter which is imaged first from the contents of the process data telegram (receiving direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... A180 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1B 80 00 hex	206Eh	0h
A110.1 Global r=1, w=1	**USS PZD Mapping Rx 2. mapped Parameter:** Address of the parameter which is imaged second from the contents of the process data telegram (receiving direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D230 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1B 80 01 hex	206Eh	1h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A110.2 Global r=1, w=1	**USS PZD Mapping Rx 3. mapped Parameter:** Address of the parameter which is imaged third from the contents of the process data telegram (receiving direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1B 80 02 hex	206Eh	2h
A110.3 Global r=1, w=1	**USS PZD Mapping Rx 4. mapped Parameter:** Address of the parameter which is imaged fourth from the contents of the process data telegram (receiving direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1B 80 03 hex	206Eh	3h
A110.4 Global r=1, w=1	**USS PZD Mapping Rx 5. mapped Parameter:** Address of the parameter which is imaged fifth from the contents of the process data telegram (receiving direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1B 80 04 hex	206Eh	4h
A110.5 Global r=1, w=1	**USS PZD Mapping Rx 6. mapped Parameter:** Address of the parameter which is imaged sixth from the contents of the process data telegram (receiving direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1B 80 05 hex	206Eh	5h
A113 Global read (1)	**USS PZD Rx Len:** Indicator parameter which shows the length in bytes of the expected process data telegram with reference values of USS master for the current parameterization. **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 0 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 1C 40 00 hex	2071h	0h
A114.0 Global r=1, w=1	**USS PZD Mapping Tx 1. mapped Parameter:** Address of the parameter which is imaged first in the contents of the process data telegram (sending direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... E200 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1C 80 00 hex	2072h	0h
A114.1 Global r=1, w=1	**USS PZD Mapping Tx 2. mapped Parameter:** Address of the parameter which is imaged second in the contents of the process data telegram (sending direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... E100 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1C 80 01 hex	2072h	1h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A114.2 Global r=1, w=1	**USS PZD Mapping Tx 3. mapped Parameter:** Address of the parameter which is imaged third in the contents of the process data telegram (sending direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1C 80 02 hex	2072h	2h
A114.3 Global r=1, w=1	**USS PZD Mapping Tx 4. mapped Parameter:** Address of the parameter which is imaged fourth in the contents of the process data telegram (sending direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1C 80 03 hex	2072h	3h
A114.4 Global r=1, w=1	**USS PZD Mapping Tx 5. mapped Parameter:** Address of the parameter which is imaged fifth in the contents of the process data telegram (sending direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1C 80 04 hex	2072h	4h
A114.5 Global r=1, w=1	**USS PZD Mapping Tx 6. mapped Parameter:** Address of the parameter which is imaged sixth in the contents of the process data telegram (sending direction as seen by the inverter). **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 1C 80 05 hex	2072h	5h
A117 Global read (1)	**USS PZD Tx Len:** Indicator parameter which indicates the length in bytes of the process data telegram to be sent with actual values to the USS master for the current parameterization. **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 0 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 1D 40 00 hex	2075h	0h
A118 Global r=1, w=1	**USS PZD scaling:** The selection is made here between internal raw values and whole numbers for the representation/scaling of parameter values during transmission via the process data telegram. Regardless of this setting, the representation can be selected separately via the read-parameter or write-parameter services. **NOTE** The parameter is only visible when a USS device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *0: integer without point*; Values are transferred as whole number in user units * number of positions after the decimal point to the 10th power. *1: native*; Values are transferred in the internal inverter raw format (e.g., increments). Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 1D 80 00 hex	2076h	0h
A140 Global read (0)	**LCD line0:** Indication as character string of the top display line. Fieldbus: Type: Str16; USS-Adr: 01 23 00 00 hex	208Ch	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A141 Global read (0)	**LCD line1:** Indication as character string of the bottom display line. Fieldbus: Type: Str16; USS-Adr: 01 23 40 00 hex	208Dh	0h
A142 Global read (3)	**Key code:** Code of the effective key.. *0=none, 1=LEFT, 2=RIGHT, 3=AB, 4=AUF, 5=#, 6=ESC, 7=F1, 8=F2, 9=F3, 10=F4, 11=HAND, 12= EIN, 13=AUS, 14=I/O* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 23 80 00 hex	208Eh	0h
A144 Global r=3, w=0	**Remote key code:** Key activations can be simulated by writing this parameter. For meaning, see **A142**. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 24 00 00 hex	2090h	0h
A146 Axis r=3, w=3	**Display Mode:** Mit den Parametern **A146** bis **A149** wird die Display-Anzeige des Umrichters parametriert. In **A146** wird der Display-Modus eingestellt. Bei der Einstellung *0: Anzeige Geschw./Strom* wird die Standardanzeige verwendet. Ist **A146** auf *2:Terminal* eingestellt, werden die in **A147** und **A148** eingetragenen Zeichenketten angezeigt. Damit kann zum Beispiel eine Meldung der SPS dargestellt werden. Bei der Auswahl *4:Parameter aus A149 + BEH* wird der Wert des in **A149** eingetragenen Parameters angezeigt. *0: display speed/current;* *2: terminal;* *4: Parameter from A149+MU;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 24 80 00 hex	2092h	0h
A147 Axis r=3, w=3	**Line 0:** The indication on the display of the inverter is parameterized with parameters **A146** to **A149**. When **A146** is set to *2:terminal*, the character strings entered in **A147** and **A148** are indicated. For example, this can be used to display a message from the PLC. Fieldbus: Type: Str16; USS-Adr: 01 24 C0 00 hex	2093h	0h
A148 Axis r=3, w=3	**Line 1:** The indication on the display of the inverter is parameterized with parameters **A146** to **A149**. When **A146** is set to *2:terminal*, the character strings entered in **A147** and **A148** are indicated. For example, this can be used to display a message from the PLC. Fieldbus: Type: Str16; USS-Adr: 01 25 00 00 hex	2094h	0h
A149 Axis r=3, w=3	**Display parameter:** The indication on the display of the inverter is parameterized with parameters **A146** to **A149**. When **A146** is set to *4:Parameter from A149 + MU*, the value of the parameter entered in **A149** is indicated. *Value range: A00 ... 1.D399 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 25 40 00 hex	2095h	0h
A150 Axis, OFF r=1, w=3	**Cycle time:** Cycle time of the real-time configuration on the axis. The load of the real-time task can be checked in parameter **E191** runtime usage. When the computing load becomes too great, the event *"57:runtime usage"* is triggered. **NOTE** Changing this parameter may mean that a changed configuration is detected when you go online with POSITool. *4: 1ms;* *5: 2ms;* *6: 4ms;* *7: 8ms;* *8: 16ms;* *9: 32ms;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 25 80 00 hex	2096h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A180 Global r=2, w=2	**Device control byte:** This byte contains control signals for device control. It is designed for fieldbus communication. The particular bit is only active when *2:Parameter* is set in the related source selector (**A60** ... **A65)**. The signals can be monitored directly via the parameters **A300** ... **A305** on the device controller. • Bit-0: Additional enable, takes effect in addition to terminal enable. Must be HIGH. Removal of the enable can also trigger a **quick stop** (set enable quick stop **A44** =*1:active*). The brakes are applied and the end stage switches off. • Bit-1: Acknowledge (reset) faults • Bit-2: Quick stop. The active ramp is **I17** (for positioning control) or **D81** (speed control). • Bit-3,4: With multiple-axis operation, the axis to be activated is selected here. Bit4 Bit3 Axis 0 0 Axis 1 0 1 Axis 2 1 0 Axis 3 1 1 Axis 4 • Bit-5: Deactivate all axes. No motor on. • Bit-6: Release brake immediately. • Bit-7: Bit 7 in **A180** (device control byte) is copied to bit 7 in **E200** (device status byte) during each cycle of the device controller. When bit 7 is toggled in **A180**, the host PLC is informed of a concluded communication cycle (send, evaluate and return data). This makes cycle time-optimized communication (e.g., with PROFIBUS) possible. The handshake bit 7 in **A180** / **E200** supplies no information on whether the application reacted to the process data. Depending on the application, other routines are provided (e.g., motion ID for command positioning). *Value range: 0 ... 00000001bin ... 255 (Representation binary)* Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 01 2D 00 00 hex	20B4h	0h
A200 Global r=3, w=3	**COB-ID SYNC Message:** Specifies the identifier for which the inverter expects the receipt of the SYNC telegrams from CAN-Bus. For most applications the default value should not be changed. *Value range: 1 ... 128 ... 2047* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 32 00 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20C8h	0h
A201 Global r=3, w=3	**Communication Cycle Period:** When SYNCs are specified in a fixed time frame for transmission of the PDO telegrams, **A201** can be used for monitoring. The entry of 0 µsec means the parameter is deactivated. When activated the cycle time of the SYNC telegrams is entered in µsec. The threshold value for triggering a timeout is 150% of this value. Monitoring takes place when the NMT status is Operational and at least one SYNC telegram was received. When the threshold value is exceeded, fault 52:Communication with cause 2:CAN SYNC Error is triggered. The red LED of the CAN5000 option board flashes three times briefly and then goes off for 1 second. Monitoring is deactivated when the NMT status Operational is exited and the entered value is set to 0 µsec. *Value range in us: 0 ... 0 ... 32000000* Fieldbus: 1LSB=1us; Type: U32; USS-Adr: 01 32 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20C9h	0h
A203 Global r=1, w=1	**Guard Time:** The master monitors the slaves with the node-guarding routine. The master polls node-guarding telegrams cyclically. Parameter **A203** specifies the cycle time in msec. The routine is inactive when a cycle time of 0 msec is set. *Value range in ms: 0 ... 0 ... 4000* Fieldbus: 1LSB=1ms; Type: U16; USS-Adr: 01 32 C0 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20CBh	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A204 Global r=1, w=1	**Life Time Factor:** The parameter **A204** is used during the node guard routine to monitor the master. When the queries of the master do not arrive at the slave within a certain amount of time, the inverter triggers the life guard event (i.e., fault 52:communication). The time is calculated by multiplying the parameters **A204** and **A203**. *Value range: 0 ... 0 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 33 00 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20CCh	0h
A207 Global r=3, w=3	**COB-ID Emergency Object:** Specifies the identifier for which the inverter sends the emergency telegrams to the CAN-Bus. Usually the default value should not be changed since this also deactivates the automatic identifier assignment after the Pre-Defined Connection Set. *Value range: 0 ... 128 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 33 C0 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20CFh	0h
A208 Global r=3, w=3	**Inhibit Time Emergency:** Specifies the time in multiples of 100 µsec which the inverter must at least wait between the sending of emergency telegrams. *Value range in 100 us: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1·100 us; Type: U32; USS-Adr: 01 34 00 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20D0h	0h
A210 Global r=1, w=1	**Producer Heartbeat Time:** In case the heartbeat protocol is to be used by the master for station monitoring on the CAN-Bus, this time specifies in msec how frequently the inverter will send heartbeat messages. *Value range in ms: 0 ... 0 ... 65535* Fieldbus: 1LSB=1ms; Type: U16; USS-Adr: 01 34 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20D2h	0h
A211 Global r=3, w=3	**Verify Config. Configuration date:** The date on which the configuration and parameterization were finished can be stored here as the number of days since 01.01.1984. *Value range in days from 01.01.1984: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1days from 01.01.1984; Type: U32; USS-Adr: 01 34 C0 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20D3h	0h
A212 Global r=3, w=3	**Verify Config. Configuration time:** The time at which the configuration and parameterization were finished can be stored here as the number of msec since 0:00 hours. *Value range in ms: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1ms; Type: U32; USS-Adr: 01 35 00 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20D4h	0h
A213 Global r=1, w=1	**Fieldbusscaling:** The selection is made here between internal raw values and whole numbers for the representation/scaling of process data values during transmission via the four PDO channels. Regardless of this setting, the representation via SDO is always the whole number. **Caution:** When *"0:integer"* is parameterized (scaled values), the runtime load increases significantly and it may become necessary to increase **A150** Cycle time to avoid the fault *"57:runtime usage"* or *"35:Watchdog."* *0: integer without point;* Values are transmitted as whole numbers in user units * the number of positions after the decimal place to the power of 10. *1: native;* Values are transferred at optimized speed in internal inverter raw format (e.g., increments). Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 35 40 00 hex	20D5h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A214 Global r=3, w=3	**CAN Bit Sample-Access-Point:** Specifies the position at which the bits received by CAN-Bus are scanned. Arbitrary changes of the default value may cause transmission problems. *-1: CIA;* *0: SAP-1;* *1: SAP-2;* *2: SAP-3;* Fieldbus: 1LSB=1; Type: I8; USS-Adr: 01 35 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20D6h	0h
A218.0 Global r=2, w=2	**2. Server SDO Parameter . COB-ID Client -> Server:** Specifies the identifier for which the inverter expects the telegrams for the 2nd SDO channel with the requests from the client. As soon as a station with a node-ID > 31 is active on the CAN-Bus, this parameter must be changed and the automatic identifier assignment after the Pre-Defined Connection Set is also disabled. If the value is 0 or if bit 31 is 1, this SDO channel is turned off. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 36 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DAh	0h
A218.1 Global r=2, w=2	**2. Server SDO Parameter . COB-Id Server -> Client:** Specifies the identifier for which the inverter sends the telegrams for the 2nd SDO channel with the responses from the client. As soon as a station with a node-ID > 31 is active on the CAN-Bus, this parameter must be changed and the automatic identifier assignment after the Pre-Defined Connection Set is also disabled. If the value is 0 or if bit 31 is 1, this SDO channel is turned off. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 36 80 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DAh	1h
A218.2 Global r=2, w=2	**2. Server SDO Parameter . Node-ID of SDO's Client:** The client which uses this SDO channel can enter its own node ID here for information purposes. *Value range: 0 ... 0 ... 127* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 36 80 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DAh	2h
A219.0 Global r=2, w=2	**3. Server SDO Parameter . COB-ID Client -> Server:** Specifies the identifier for which the inverter sends the telegrams for the 3rd SDO channel with the requests from the client. As soon as a station with a node-ID > 31 is active on the CAN-Bus, this parameter must be changed and the automatic identifier assignment after the Pre-Defined Connection Set is also disabled. If the value is 0 or if bit 31 is 1, this SDO channel is turned off. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 36 C0 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DBh	0h
A219.1 Global r=2, w=2	**3. Server SDO Parameter . COB-Id Server -> Client:** Specifies the identifier for which the inverter sends the telegrams for the 3rd SDO channel with the responses to the client. As soon as a station with a node-ID > 31 is active on the CAN-Bus, this parameter must be changed and the automatic identifier assignment after the Pre-Defined Connection Set is also disabled. If the value is 0 or if bit 31 is 1, this SDO channel is turned off. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 36 C0 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DBh	1h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A219.2 Global r=2, w=2	**3. Server SDO Parameter . Node-ID of SDO's Client:** The client which uses this SDO channel can enter its own node ID here for information purposes. *Value range: 0 ... <u>0</u> ... 127* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 36 C0 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DBh	2h
A220.0 Global r=2, w=2	**4. Server SDO Parameter . COB-ID Client -> Server:** Specifies the identifier for which the inverter expects the telegrams for the 4th SDO channel with the requests from the client. As soon as a station with a node-ID > 31 is active on the CAN-Bus, this parameter must be changed and the automatic identifier assignment after the Pre-Defined Connection Set is also disabled. If the value is 0 or if bit 31 is 1, this SDO channel is turned off. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... <u>0</u> ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 37 00 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DCh	0h
A220.1 Global r=2, w=2	**4. Server SDO Parameter . COB-ID Server -> Client:** Specifies the identifier for which the inverter sends the telegrams for the 4th SDO channel with the responses to the client. As soon as a station with a node-ID > 31 is active on the CAN-Bus, this parameter must be changed and the automatic identifier assignment after the Pre-Defined Connection Set is also disabled. If the value is 0 or if bit 31 is 1, this SDO channel is turned off. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... <u>0</u> ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 37 00 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DCh	1h
A220.2 Global r=2, w=2	**4. Server SDO Parameter . Node-Id of SDO's Client:** The client which uses this SDO channel can enter its own node ID here for information purposes. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... <u>0</u> ... 127* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 37 00 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DCh	2h
A221.0 Global r=2, w=2	**1. rec. PDO Parameter . COB-ID:** Specifies the identifier for which the inverter expects the telegrams for the 1st PDO channel from the master. Usually the default value should not be changed since this also disables the automatic identifier assignment after the Pre-Defined Connection Set. If the value is 0 or bit 31 is 1, this service is off. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... <u>512</u> ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 37 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DDh	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A221.1 Global r=2, w=2	**1. rec. PDO Parameter . Transmission Type:** Specifies the type of transmission (with or without SYNC, etc.) when received process data from this 1st PDO channel are accepted by the inverter. See CAN-Bus documentation, impr. no. 441684. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 254 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 37 40 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DDh	1h
A222.0 Global r=2, w=2	**2. rec. PDO Parameter . COB-ID:** Identifier for the receiving direction of the 2nd PDO channel. See **A221**.0 **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 768 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 37 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DEh	0h
A222.1 Global r=2, w=2	**2. rec. PDO Parameter . Transmission Type:** Transmission type for 2nd PDO channel. See **A221**.1. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 254 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 37 80 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20DEh	1h
A225.0 Global r=1, w=1	**1. rec. PDO Mapping Rx. 1. mapped Parameter:** Address of the parameter which is imaged first from the contents of the 1st PDO channel (receiving direction as seen by the inverter). **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... A180 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E1h	0h
A225.1 Global r=1, w=1	**1. rec. PDO Mapping Rx. 2. mapped Parameter:** Address of the parameter which is imaged second from the contents of the 1st PDO channel (receiving direction). **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... A101 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 40 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E1h	1h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A225.2 Global r=1, w=1	**1. rec. PDO Mapping Rx. 3. mapped Parameter:** Address of the parameter which is imaged third from the contents of the 1st PDO channel (receiving direction). **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D210 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 40 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E1h	2h
A225.3 Global r=1, w=1	**1. rec. PDO Mapping Rx. 4. mapped Parameter:** Address of the parameter which is imaged fourth from the contents of the 1st PDO channel (receiving direction). **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D211 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 40 03 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E1h	3h
A225.4 Global r=1, w=1	**1. rec. PDO Mapping Rx. 5. mapped Parameter:** Address of the parameter which is imaged fifth from the contents of the 1st PDO channel (receiving direction). **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D212 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 40 04 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E1h	4h
A225.5 Global r=1, w=1	**1. rec. PDO Mapping Rx. 6. mapped Parameter:** Address of the parameter which is imaged sixth from the contents of the 1st PDO channel (receiving direction). **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 40 05 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E1h	5h
A226.0 Global r=2, w=2	**2. rec. PDO Mapping Rx. 1. mapped Parameter:** For 2nd PDO channel, see **A225**.0. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D232 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E2h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A226.1 Global r=2, w=2	**2. rec. PDO Mapping Rx. 2. mapped Parameter:** For 2nd PDO channel, see **A225**.1. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 80 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E2h	1h
A226.2 Global r=2, w=2	**2. rec. PDO Mapping Rx. 3. mapped Parameter:** For 2nd PDO channel, see **A225**.2. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 80 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E2h	2h
A226.3 Global r=2, w=2	**2. rec. PDO Mapping Rx. 4. mapped Parameter:** For 2nd PDO channel, see **A225**.3. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 80 03 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E2h	3h
A226.4 Global r=2, w=2	**2. rec. PDO Mapping Rx. 5. mapped Parameter:** For 2nd PDO channel, see **A225**.4. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 80 04 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E2h	4h
A226.5 Global r=2, w=2	**2. rec. PDO Mapping Rx. 6. mapped Parameter:** For 2nd PDO channel, see **A225**.5. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 38 80 05 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E2h	5h
A229.0 Global r=2, w=2	**1. trans. PDO Parameter . COB-ID:** Specifies the identifier for which the inverter sends the telegrams for the 1st PDO channel to the master. Usually the default value should not be changed since the automatic identifier assignment after the Pre-Defined Connection Set is also disabled. If the value is 0 or bit 31 is 1, this service is off. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... <u>384</u> ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 39 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E5h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A229.1 Global r=2, w=2	**1. trans. PDO Parameter . Transmission Type:** Specifies the transmission type (with or without SYNC, etc.) when process data are sent via this 1st PDO channel. See CAN-Bus documentation, impr. no. 441686. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 254 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 39 40 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E5h	1h
A229.2 Global r=2, w=2	**1. trans. PDO Parameter . Inhibit Time:** Specifies the time in multiples of 100 µsec which the inverter must adhere to between sending PDO telegrams on channel 1. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range in 100 us: 0 ... 0 ... 65535* Fieldbus: 1LSB=1·100 us; Type: U16; USS-Adr: 01 39 40 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E5h	2h
A229.3 Global r=2, w=2	**1. trans. PDO Parameter . Event Timer:** When transmission type *"254: Event-Triggerd"* is set, the telegram is sent either after an internal event or after the time set here in msec. See **A220**.1. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range in ms: 0 ... 0 ... 65535* Fieldbus: 1LSB=1ms; Type: U16; USS-Adr: 01 39 40 03 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E5h	3h
A230.0 Global r=2, w=2	**2. trans. PDO Parameter . COB-ID:** Identifier for sending direction of the 2nd PDO channel. See **A229**.0. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 640 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 39 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E6h	0h
A230.1 Global r=2, w=2	**2. trans. PDO Parameter . Transmission Type:** Transmission type for 2nd PDO channel. See **A229**.1. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: 0 ... 254 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 39 80 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E6h	1h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A230.2 Global r=2, w=2	**2. trans. PDO Parameter . Inhibit Time:** Pause time for PDO channel 2. See **A229**.2. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range in 100 us: 0 ... 0 ... 65535* Fieldbus: 1LSB=1·100 us; Type: U16; USS-Adr: 01 39 80 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E6h	2h
A230.3 Global r=2, w=2	**2. trans. PDO Parameter . Event Timer:** For PDO channel 2. See **A229**.3. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range in ms: 0 ... 0 ... 65535* Fieldbus: 1LSB=1ms; Type: U16; USS-Adr: 01 39 80 03 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E6h	3h
A233.0 Global r=1, w=1	**1. trans. PDO Mapping Tx. 1. mapped Parameter:** Address of the parameter which is imaged first on the 1st PDO channel for sending. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... E200 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E9h	0h
A233.1 Global r=1, w=1	**1. trans. PDO Mapping Tx. 2. mapped Parameter:** Address of the parameter which is imaged second on the 1st PDO channel for sending. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... A101 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 40 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E9h	1h
A233.2 Global r=1, w=1	**1. trans. PDO Mapping Tx. 3. mapped Parameter:** Address of the parameter which is imaged third on the 1st PDO channel for sending. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D200 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 40 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E9h	2h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A233.3 Global r=1, w=1	**1. trans. PDO Mapping Tx. 4. mapped Parameter:** Address of the parameter which is imaged fourth on the 1st PDO channel for sending. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D201 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 40 03 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E9h	3h
A233.4 Global r=1, w=1	**1. trans. PDO Mapping Tx. 5. mapped Parameter:** Address of the parameter which is imaged fifth on the 1st PDO channel for sending. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... D202 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 40 04 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E9h	4h
A233.5 Global r=1, w=1	**1. trans. PDO Mapping Tx. 6. mapped Parameter:** Address of the parameter which is imaged sixth on the 1st PDO channel for sending. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 40 05 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20E9h	5h
A234.0 Global r=2, w=2	**2. trans. PDO Mapping Tx. 1. mapped Parameter:** For 2nd PDO channel. See **A233**.0. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. *Value range: A00 ... E08 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EAh	0h
A234.1 Global r=2, w=2	**2. trans. PDO Mapping Tx. 2. mapped Parameter:** For 2nd PDO channel. See **A233**.1. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 80 01 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EAh	1h
A234.2 Global r=2, w=2	**2. trans. PDO Mapping Tx. 3. mapped Parameter:** For 2nd PDO channel. See **A233**.2. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 80 02 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EAh	2h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A234.3 Global r=2, w=2	**2. trans. PDO Mapping Tx. 4. mapped Parameter:** For 2nd PDO channel. See **A233**.3. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 80 03 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EAh	3h
A234.4 Global r=2, w=2	**2. trans. PDO Mapping Tx. 5. mapped Parameter:** For 2nd PDO channel. See **A233**.4. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 80 04 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EAh	4h
A234.5 Global r=2, w=2	**2. trans. PDO Mapping Tx. 6. mapped Parameter:** For 2nd PDO channel. See **A233**.5. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 01 3A 80 05 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EAh	5h
A237 Global read (1)	**1. rec. PDO-Mapped Len:** Indication parameter indicating in bytes the size of the expected receive telegram of the 1st PDO channel for the current parameterization. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 3B 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EDh	0h
A238 Global read (2)	**2. rec. PDO-Mapped Len:** For 2nd PDO channel. See **A237**. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 3B 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20EEh	0h
A241 Global read (1)	**1. trans. PDO-Mapped Len:** Indication parameter indicating in bytes the size of the expected send telegram of the 1st PDO channel for the current parameterization. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 3C 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20F1h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A242 Global read (2)	**2. trans. PDO-Mapped Len:** For 2nd PDO channel. See **A241**. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 3C 80 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20F2h	0h
A245 Global r=3, w=3	**CAN diagnostic:** Indication of internal inverter diagnostic information via the CAN-Bus interface. Bits 0-2: NMT state, state of the CANopen state machine: 0=Inactive, 1=Reset application, 2=Reset communication, 3=Bootup, 4=Pre-operational, 5=Stopped 6=Operational Bit 3: CAN controller indicates warning level. Bit 4: CAN controller indicates bus off. Bit 5: Toggle bit: Telegrams are being received on SDO channel 1. Bit 6: Memory bit: Receiving FIFO of SDO channel 1 has exceeded the half-full filling level. (Client is sending telegrams faster than they can be processed by the inverter.) Bit 7: Toggle bit: Telegrams are being received on PDO channel 1 (only for Operational). Bit 8: Memory bit: Receiving FIFO of PDO channel 1 has exceeded the half-full filling level (only for Operational). (Client is sending telegrams faster than they can be processed by the inverter.) Bit 9: Current state of the red LED on CAN 5000, is 1 when LED is on. Bit 10: Current state of the green LED on CAN 5000, is 1 when LED is on. Bit 11: PDO sync relationship error: PDO1 is using sync. All bits can be briefly deleted by sending NMT command Reset Node. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3D 40 00 hex 👁 Only visible when the CAN 5000 option is installed or when CAN 5000 was selected as option module 2 in the device configuration.	20F5h	0h
A252.0 Global r=3, w=3	**EtherCAT Sync Manager 2 PDO Assign:** The Sync-Manager 2 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process output data with **reference values** are sent by the EtherCAT master to the inverter. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the CANopen index of parameter **A225** (1600 hex) in **element 0** of this parameter. The indices of the parameters **A226** (1601 hex), **A227** (1602 hex) or **A228** (1603 hex) can then be entered as necessary in the other elements. The value 0 indicates a blank entry. *Value range: 0 ... 1600hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 00 00 hex	20FCh Array	0h
A252.1 Global r=3, w=3	**EtherCAT Sync Manager 2 PDO Assign:** The Sync-Manager 2 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process output data with **reference values** are sent by the EtherCAT master to the inverter. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the CANopen index of parameter **A226** (1601 hex) in **element 1** of this parameter. The indices of the parameters **A225** (1600 hex), **A227** (1602 hex) or **A228** (1603 hex) can then be entered as necessary in the other elements. The value 0 indicates a blank entry. *Value range: 0 ... 1601hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 00 01 hex	20FCh Array	1h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A252.2 Global r=3, w=3	**EtherCAT Sync Manager 2 PDO Assign:** The Sync-Manager 2 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process output data with **reference values** are sent by the EtherCAT master to the inverter. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the value 0 (for unused) in **element 2** of this parameter because the indices of parameters **A225** (1600 hex) and **A226** (1601 hex) have already been entered as default values in elements 0 and 1. Up to 12 parameters can already be transferred in this way. If more process data are required, the CANopen index of parameter **A227** (1602 hex) can be specified here. However, remember that the corresponding block **100921** ECS PDO3-rx Map must also be instanced here. *Value range: 0 ... 0000hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 00 02 hex	20FCh Array	2h
A252.3 Global r=3, w=3	**EtherCAT Sync Manager 2 PDO Assign:** The Sync-Manager 2 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process output data with **reference values** are sent by the EtherCAT master to the inverter. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the value 0 (for unused) in **element 3** of this parameter because the indices of parameters **A225** (1600 hex) and **A226** (1601 hex) have already been entered as default values in elements 0 and 1 and sometimes the index of **A227** (1603 hex) in element 2. Up to 18 parameters can already be transferred in this way. If more process data are required, the CANopen index of parameter **A228** (1603 hex) can be specified here. However, remember that the corresponding block **100923** ECS PDO4-rx Map must also be instanced here. *Value range: 0 ... 0000hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 00 03 hex	20FCh Array	3h
A253.0 Global r=3, w=3	**EtherCAT Sync Manager 3 PDO Assign:** The Sync-Manager 3 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process input data with **actual values** are sent by the inverter to the EtherCAT master. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the CANopen index of parameter **A233** (1A00 hex) in **element 0** of this parameter. The indices of the parameters **A234** (1A01 hex), **A235** (1A02 hex) or **A236** (1A03 hex) can then be entered as necessary in the other elements. The value 0 indicates a blank entry. *Value range: 0 ... 1A00hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 40 00 hex	20FDh Array	0h
A253.1 Global r=3, w=3	**EtherCAT Sync Manager 3 PDO Assign:** The Sync-Manager 3 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process input data with **actual values** are sent by the inverter to the EtherCAT master. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the CANopen index of parameter **A234** (1A01 hex) in **element 1** of this parameter. The indices of the parameters **A233** (1A00 hex), **A235** (1A02 hex) or **A236** (1604 hex) can then be entered as necessary in the other elements. The value 0 indicates a blank entry. *Value range: 0 ... 1A01hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 40 01 hex	20FDh Array	1h
A253.2 Global r=3, w=3	**EtherCAT Sync Manager 3 PDO Assign:** The Sync-Manager 3 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process input data with **actual values** are sent by the inverter to the EtherCAT master. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the value 0 (for unused) in **element 2** of this parameter because the indices of parameters **A233** (1A00 hex) and **A234** (1A01 hex) have already been entered as default values in elements 0 and 1. Up to 12 parameters can already be transferred in this way. If more process data are required, the CANopen index of parameter **A235** (1A02 hex) can be specified here. However, remember that the corresponding block **100922** ECS PDO3-rx Map must also be instanced here. *Value range: 0 ... 0000hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 40 02 hex	20FDh Array	2h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A253.3 Global r=3, w=3	**EtherCAT Sync Manager 3 PDO Assign:** The Sync-Manager 3 controls the memory size and the access of the inverter processor to the portion of memory in the EtherCAT Slave Controller (ESC) in which the process input data with **actual values** are sent by the inverter to the EtherCAT master. These data specify which PDO mapping parameters are assigned to this Sync-Manager. This array contains four elements of the data type U16. We recommend entering the value 0 (for unused) in **element 3** of this parameter because the indices of parameters **A233** (1A00 hex) and **A234** (1A01 hex) have already been entered as default values in elements 0 and 1 and sometimes the index of **A235** (1A03 hex) in element 2. Up to 18 parameters can already be transferred in this way. If more process data are required, the CANopen index of parameter **A236** (1A03 hex) can be specified here. However, remember that the corresponding block **100924** ECS PDO4-tx Map must also be instanced here. *Value range: 0 ... 0000hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 3F 40 03 hex	20FDh Array	3h
A256 Global r=3, w=3	**EtherCAT Address:** Shows the address of the inverter within the EtherCAT network. The value is usually specified by the EtherCAT master. It is either derived from position of the station within the EtherCAT ring or is purposely selected by the user. Values usually start at 1001 hexadecimal (1001h is the first device after the EtherCAT master, 1002h is the second, and so on). *Value range: 0 ... 0 ... 65535* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 40 00 00 hex	2100h	0h
A257.0 Global read (3)	**EtherCAT Diagnosis:** Indication of internal inverter diagnostic information on the EtherCAT interface ECS 5000 and the connection to the EtherCAT. A text with the following format is indicated in element 0: "**StX ErX L0X L1X**" Part 1 of the text means: **St** Abbreviation of EtherCAT Device State (State of the EtherCAT State Machine) **X** Digit for state: **1** Init State **2** Pre-operational state (**3** Requested Bootstrap State is not supported.) **4** Safe-operational state **8** Operational state **0x11** Error during INIT State **0x12** Error during PREOP State **(0x13** Error during BOOTSTRAP) State **0x14** Error during Safe-Operational State **0x18** Error during Operational State Part 2 of the text means: **Er** Abbreviation of EtherCAT Device Error **X** Digit for state: **0** No error **1** Booting error, ECS 5000 error **2** Invalid configuration, select configuration with EtherCAT in POSI Tool. **3** Unsolicited state change, inverter has changed state by itself. **4** Watchdog, no more data from EtherCAT even though timeout time expired. **5** PDI watchdog, host processor timeout Part 3 of the text means: **L0** Abbreviation for LinkOn of port 0 (the RJ45 socket labeled "IN") **X** Digit for state: **0** No link (no connection to other EtherCAT device) **1** Link detected (connection to other device found) Part 4 of the text means: **L1** Abbreviation for LinkOn of port 1 (the RJ45 socket labeled "OUT") **X** Digit for state: **0** No link (no connection to other EtherCAT device) **1** Link detected (connection to other device found) Fieldbus: Type: Str16; USS-Adr: 01 40 40 00 hex	2101h Array	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A257.1 Global read (3)	**EtherCAT Diagnosis:** Indication of internal inverter diagnostic information on the EtherCAT interface ECS 5000 and the connection to the EtherCAT. A text with the following format is indicated in element 1: „**L0 xx L1 xx**" Part 1 of the text means: **L0** Abbreviation for Link Lost Counter Port 0 (RJ45 socket labeled "IN") **xx** Number of lost connections (hexadecimal) on the port Part 2 of the text means: **L1** Abbreviation for Link Lost Counter Port 1 (RJ45 socket labeled "OUT") **xx** Number of lost connections (hexadecimal) on the port. Fieldbus: Type: Str16; USS-Adr: 01 40 40 01 hex	2101h Array	1h
A257.2 Global read (3)	**EtherCAT Diagnosis:** Indication of internal inverter diagnostic information on the EtherCAT interface ECS 5000 and the connection to the EtherCAT. A text with the following format is indicated in element 2: „**R0 xxxx R1 xxxx**" Part 1 of the text means: **R0** Abbreviation for Rx ErrorCounter Port 0 (RJ45 socket labeled "IN") **xxxx** ErrorCounter in hexadecimal with number of registered errors such as, for example, FCS checksum, … Part 2 of the text means: **R0** Abbreviation for Rx ErrorCounter Port 1 (RJ45 socket labeled "OUT") **xxxx** ErrorCounter in hexadecimal with number of registered errors such as, for example, FCS checksum, … Fieldbus: Type: Str16; USS-Adr: 01 40 40 02 hex	2101h Array	2h
A258 Global r=3, w=3	**EtherCAT PDO Timeout:** This PDO monitoring function (PDO = Process Data Object) should be activated so that the inverter does not continue with the last received reference values after a failure of the EtherCAT network or the master. After the EtherCAT master has put this station (the inverter in this case) into the state "OPERATIONAL," it begins to send new process data (reference values, and so on) cyclically. When this monitor function has been activated, it is active in the "OPERATIONAL" state. When no new data are received via EtherCAT for longer than the set timeout time, the monitor function triggers the fault *52:communication* with the cause of fault *6:EtherCAT PDO*. If the EtherCAT master shuts down this station correctly (exits the "OPERATIONAL" state), the monitoring function is not triggered. The timeout time can be set in milliseconds with this parameter. The following special setting values are available: 0: Monitoring inactive 1 to 99: Monitoring by STÖBER watchdog is active. Timeout time is always 1000 milliseconds. From 100: Monitoring by STÖBER watchdog is active. The numeric value is the timeout value in milliseconds. 65534: Monitoring is not set by this value but by the "SM Watchdog" functionality of EtherCAT. This is in preparation. For diagnosis of this externally set function, see parameter **A259.** 65535: Monitoring inactive *Value range in ms: 0 ... <u>65535</u> ... 65535* Fieldbus: 1LSB=1ms; Type: U16; USS-Adr: 01 40 80 00 hex	2102h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A259.0 Global read (3)	**EtherCAT SM-Watchdog:** This PDO monitoring function (PDO = Process Data Object) should be activated so that the inverter does not continue with the last received reference values after a failure of the EtherCAT network or the master. If the value 65534 was set in another parameter **A258** EtherCAT PDO-Timeout, the timeout can be set in the EtherCAT master (TwinCAT software). The result is then indicated in this parameter: Element 0 contains the resulting watchdog time in 1 milliseconds. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 40 C0 00 hex	2103h Array	0h
A259.1 Global read (3)	**EtherCAT SM-Watchdog:** This PDO monitoring function (PDO = Process Data Object) should be activated so that the inverter does not continue with the last received reference values after a failure of the EtherCAT network or the master. If the value 65534 was set in another parameter **A258** EtherCAT PDO-Timeout, the timeout can be set in the EtherCAT master (TwinCAT software). The result is then indicated in this parameter: Element 1 contains whether the watchdog was just triggered (1) or not (0). When the watchdog is triggered and the function is activated (see value 65534 in parameter **A258**), the fault *52:communication* is triggered on the inverter with cause of fault *6:EtherCAT PDO*. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 40 C0 01 hex	2103h Array	1h
A259.2 Global read (3)	**EtherCAT SM-Watchdog:** This PDO monitoring function (PDO = Process Data Object) should be activated so that the inverter does not continue with the last received reference values after a failure of the EtherCAT network or the master. If the value 65534 was set in another parameter **A258** EtherCAT PDO-Timeout, the timeout can be set in the EtherCAT master (TwinCAT software). The result is then indicated in this parameter: Element 2 contains the number of times this watchdog has been triggered. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 40 C0 02 hex	2103h Array	2h
A260 Global r=3, w=3	**EtherCAT synchronization mode:** Activation of EtherCAT synchronization mode on the inverter. The inverter offers the option of monitoring the synchronization between master and inverter via Distributed Clock. A check is made to determine whether the time difference between the arrival of the EtherCAT Frame at the inverter and the point in time of the SYNC0 signal on the inverter is within a tolerable time range. When monitoring is activated, Sync errors are counted with an error counter and indicated in parameter **A261**.2. Synchronization mode is deactivated and activated by entering the following values: 0: Synchronization deactivated 1: Synchronization active Other values are not defined and are therefore not permitted. **CAUTION** When the PLC cycle time is not the SYNC0 cycle time, all synchronization errors can no longer be detected. **CAUTION** Activation of synchronization mode requires different amounts of run time depending on the cycle time of the PLC and the inverter. With high-performance applications are being run on the inverter, activation of synchronization mode may cause the error "runtime load." *Value range: 0 ... <u>0</u> ... 65535* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 41 00 00 hex	2104h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A261.0 Global read (3)	**EtherCAT Sync-Diagnostics:** This parameter can be used to diagnose errors in synchronization mode. The parameter indicates the following error codes: 0: No error 1: Sync Manager 2 and Sync Manager 3 have different cycle times. 2: Cycle time < 1 ms: The cycle time must be ³ 1000 µs. 3: Uneven cycle time: Cycle time must be a whole-number multiple of 1000 µs. 4: Internal error: Internal device PLL could not be started. Possible cause: The project does not contain parameter **G90**. 5: A required EtherCAT parameter does not exist. Parameters **A260** and **A261** must be available for EtherCAT with synchronization. 6: Internal error: Inverter interrupt could not be initialized. Possible cause: Firmware error Other values: Not defined Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 41 40 00 hex	2105h Array	0h
A261.1 Global read (3)	**EtherCAT Sync-Diagnostics:** This element is reserved. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 41 40 01 hex	2105h Array	1h
A261.2 Global read (3)	**EtherCAT Sync-Diagnostics:** This parameter indicates the synchronization errors which have occurred up to now between master and inverter. Synchronization mode must be activated in parameter **A260** before the counter function becomes active. When the error counter is continuously incremented, this indicates a parameterization error on the master or the inverter. Occasional incrementing of the counter (e.g., in the minutes range) indicates a jitter in the total EtherCAT system. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 41 40 02 hex	2105h Array	2h
A262.0 Global r=3, w=3	**EtherCAT Sync Manager 0 Synchronization type:** Synchronization mode for Sync Manager 0 (write mailbox). Since Sync Managers for mailbox communication are always unsynchronized, the following values are permitted for the parameter: 0 = free run mode - Unsynchronized mode Other values are not permitted. *0: Not synchronized;* *1: Synchronized with AL Event on this Sync Manager;* *2: Synchronized with AL Event Sync0;* *3: Synchronized with AL Event Sync1;* *32: Synchronized with AL Event of SM0;* *33: Synchronized with AL Event of SM1;* *34: Synchronized with AL Event of SM2;* *35: Synchronized with AL Event of SM3;* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 41 80 00 hex	2106h	0h
A262.1 Global r=3, w=3	**EtherCAT Sync Manager 0 Cycle time:** Cycle time for Sync Manager 0 (write mailbox) Since Sync Managers for mailbox communication are always unsynchronized, you may only enter the value 0 in this parameter. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 41 80 01 hex	2106h	1h
A262.2 Global r=3, w=3	**EtherCAT Sync Manager 0 Shift time:** Shift time for Sync Manager 0 (write mailbox) Since Sync Managers for mailbox communication are always unsynchronized, you may only enter the value 0 in this parameter. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 41 80 02 hex	2106h	2h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A263.0 Global r=3, w=3	**EtherCAT Sync Manager 1 Synchronization type:** Synchronization mode for Sync Manager 1 (read mailbox). Since Sync Managers for mailbox communication are always unsynchronized, the following values are permitted for the parameter: 0 = free run mode - Unsynchronized mode Other values are not permitted. *0: Not synchronized;* *1: Synchronized with AL Event on this Sync Manager;* *2: Synchronized with AL Event Sync0;* *3: Synchronized with AL Event Sync1;* *32: Synchronized with AL Event of SM0;* *33: Synchronized with AL Event of SM1;* *34: Synchronized with AL Event of SM2;* *35: Synchronized with AL Event of SM3;* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 41 C0 00 hex	2107h	0h
A263.1 Global r=3, w=3	**EtherCAT Sync Manager 1 Cycle time:** Cycle time for Sync Manager 1 (read mailbox) Since Sync Managers for mailbox communication are always unsynchronized, you may only enter the value 0 in this parameter. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 41 C0 01 hex	2107h	1h
A263.2 Global r=3, w=3	**EtherCAT Sync Manager 1 Shift time:** Shift time for Sync Manager 1 (read mailbox) Since Sync Managers for mailbox communication are always unsynchronized, you may only enter the value 0 in this parameter. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 41 C0 02 hex	2107h	2h
A264.0 Global r=3, w=3	**EtherCAT Sync Manager 2 Synchronization type:** Synchronization mode for Sync Manager 2 (prozess data output). The following values are permitted for the parameter: 0 = free run mode - Unsynchronized mode 2 = DC Sync0 - synchronized mode (synchronous to Sync0 signal) Other values are not permitted. *0: Not synchronized;* *1: Synchronized with AL Event on this Sync Manager;* *2: Synchronized with AL Event Sync0;* *3: Synchronized with AL Event Sync1;* *32: Synchronized with AL Event of SM0;* *33: Synchronized with AL Event of SM1;* *34: Synchronized with AL Event of SM2;* *35: Synchronized with AL Event of SM3;* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 42 00 00 hex	2108h	0h
A264.1 Global r=3, w=3	**EtherCAT Sync Manager 2 Cycle time:** Specification of the cycle time for Sync Manager 2 (process data output) in ns *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 42 00 01 hex	2108h	1h
A264.2 Global r=3, w=3	**EtherCAT Sync Manager 2 Shift time:** Specification of the shift time for Sync Manager 2 (process data output) in ns *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 42 00 02 hex	2108h	2h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A265.0 Global r=3, w=3	**EtherCAT Sync Manager 3 Synchronization type:** Synchronization mode for Sync Manager 3 (prozess data input). The following values are permitted for the parameter: 0 = free run mode - Unsynchronized mode 2 = DC Sync0 - synchronized mode (synchronous to Sync0 signal) Other values are not permitted. *0: Not synchronized;* *1: Synchronized with AL Event on this Sync Manager;* *2: Synchronized with AL Event Sync0;* *3: Synchronized with AL Event Sync1;* *32: Synchronized with AL Event of SM0;* *33: Synchronized with AL Event of SM1;* *34: Synchronized with AL Event of SM2;* *35: Synchronized with AL Event of SM3;* Fieldbus: 1LSB=1; Type: U16; USS-Adr: 01 42 40 00 hex	2109h	0h
A265.1 Global r=3, w=3	**EtherCAT Sync Manager 3 Cycle time:** Specification of the cycle time for Sync Manager 3 (prozess data output) in ns. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 42 40 01 hex	2109h	1h
A265.2 Global r=3, w=3	**EtherCAT Sync Manager 3 Shift time:** Specification of the shift time for Sync Manager 3 (prozess data input) in ns. *Value range: 0 ... 0 ... 4294967295* Fieldbus: 1LSB=1; Type: U32; USS-Adr: 01 42 40 02 hex	2109h	2h
A300 Global read (2)	**Additional enable:** Indicates the current value of the *AdditEna* signal (additional enable) on the interface to the device control (configuration, block 100107). The "additional enable" signal works exactly like the enable signal on terminal X1. Both signals are AND linked. This means that the power end stage of the inverter is only enabled when both signals are HIGH. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 4B 00 00 hex	212Ch	0h
A301 Global read (2)	**Fault reset:** Indicates the current value of the *FaultRes signal* (fault reset) on the interface to the device control (configuration, block 100107). The *Fault reset* signal triggers a fault reset. When the inverter has malfunctioned, a change from LOW to HIGH causes this fault to be reset if the cause of the fault has been corrected. Reset is not possible as long as **A00** Save values is active. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 4B 40 00 hex	212Dh	0h
A302 Global read (2)	**Quick stop:** Indicates the current value of the *QuickStp* signal (quick stop) on the interface to the device control (configuration, block 100107). The quick stop signal triggers a quick stop of the drive. During positioning mode, the acceleration specified in **I17** determines the braking time. When the axis is in "revolutions" (speed) mode, the parameter **D81** determines the braking time (see also **A39** and **A45**). *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 4B 80 00 hex	212Eh	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A303 Global read (2)	**Axis selector 0:** Indicates the current value of the *AxSel0* signal (axis selector 0) on the interface to the device control (configuration, block 100107). There are two "axis selector 0 / 1" signals with which one of the max. of 4 axes can be selected in binary code. **NOTE** - Axis switchover only possible with "enable off" - With the FDS 5000, the axes can only be used as parameter records for a motor. The POSISwitch® AX 5000 option cannot be connected. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 4B C0 00 hex	212Fh	0h
A304 Global read (2)	**Axis selector 1:** Indicates the current value of the *AxSel1* signal (axis selector 1) on the interface to the device control (configuration, block 100107). There are two "axis selector 0 / 1" signals with which one of the max. of 4 axes can be selected in binary code. **NOTE** - Axis switchover only possible with "enable off" - With the FDS 5000, the axes can only be used as parameter records for a motor. The POSISwitch® AX 5000 option cannot be connected. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 4C 00 00 hex	2130h	0h
A305 Global read (2)	**Axis disable:** Indicates the current value of the *AxDis* signal (axis disable) on the interface to the device control (configuration, block 100107). The axis-disable signal deactivates all axes. **NOTE** - Axis switchover only possible with "enable off" - With the FDS 5000, the axes can only be used as parameter records for a motor. The POSISwitch® AX 5000 option cannot be connected. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 4C 40 00 hex	2131h	0h
A576 Global r=1, w=1	**Control word:** Control word with control signals for the device state machine and the drive function. • Bit 0: "Switch on" - is set to 1 for switchon when bit 0 in status word "Ready to Switch On" is 1. • Bit 1: "Enable voltage" - should always be left at 1, is active. • Bit 2: "Quick stop" - is set to 0 when the drive is to come to a standstill as soon as possible. • Bit 3: "Enable operation" - is set to 1 for enable when bit 1 in status word "Switched on" is 1. • Bit 4-6: "Operation mode specific" - see below. • Bit 7: "Fault reset" - edge 0 -> 1 to acknowledge queued fault. • Bit 8: "Halt" - is not supported, always leave 0 = inactive. • Bit 9 and 10: "Reserved" - always leave 0 = inactive. • Bit 11 and 12: Axis selector, bit 0 and 1. Select the axis here for multi-axis operation. 00 = axis1, … • Bit 13: Axis disable. Deactivate all axes. No motor connected. • Bit 14: Release brake. • Bit 15: "Reserved" - always leave 0 = inactive. On bits 4-6 "operation mode specific" - the meaning of the bits depends on the operating mode of the inverter. This is set in **A608** (modes of operation). The following operating modes and related bit meanings are available at this time:	6040h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
	Job mode: • Bit-4: Jog + • Bit-5: Jog - • Bit-6: Reserved, always 0 Homing mode: • Bit-4: Homing operation start • Bit-5: Reserved, always 0 • Bit-6: Reserved, always 0 Interpolated position mode: • Bit-4: Interpolation mode active • Bit-5: Reserved, always 0 • Bit-6: Reserved, always 0 Comfort reference value: • Bit-4: HLG block, ramp generator input = 0 • Bit-5: HLG stop, freeze ramp generator input • Bit-6: HLG zero, ramp generator input = 0 (same as bit 4) Can be accessed via CANopen under: Index 6040 hex Subindex 0 *Value range: 0 ... 0000hex ... 65535 (Representation hexadecimal)* Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 01 90 00 00 hex		
A577 Global read (1)	**Status word:** The status word indicates the current state of the device. Some bits are operation mode specific. • Bit-0: "Ready to switch on" • Bit-1: "Switched on" • Bit-2: "Operation enabled" • Bit-3: "Fault" • Bit-4: "Voltage enabled" • Bit-5: "Quick stop" • Bit 6: "Switch on disabled" • Bit-7: "Warning" • Bit-8: "Message" • Bit-9: "Remote," corresponds to the negated output *Local* of block 320 Local • Bit-10: "Target reached," see below • Bit-11: "Internal limit active," 1 = limit is active • Bit-12 and 13: "Operation mode specific," see below • Bit-14 and 15: "PLL Bit0" and "PLL Bit1" with the meaning of interpolated position mode: 00: OK 01: Cycle time extended and still engaged 10: Cycle time shortened and still engaged 11: Not engaged Bit-10 "Target reached," bit-11 "Internal limit active" and bits 12 and 13 "Operation mode specific." The meaning of the bits depends on the operating mode of the inverter. This is set in the parameter **A608** modes of operation. The following operating modes are currently available with their related bit meanings: Comfort reference value: • Bit-10: "Target reached," reference-value-reached flag, same as **D183** "n-window reached" • Bit-11: "Internal limit active," 1 = limit is active, one of the following signals is active: **D182**, **D185**, **D186**, **D308**, **D309**, **D462** Homing mode: • Bit-12: Homing attained: Reference point found • Bit-13: Homing error: termination of referencing due to error	6041h	0h

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
	Interpolated position mode: • Bit-12: Interpolation mode active • Bit-13: Reserved, always 0 Can be accessed via CANopen under: Index 6041hex Subindex 0 Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 01 90 40 00 hex		
A900 Global r=3, w=4	**SysEnableOut:** Enable output of the device controller to the axis(axes). Indicates that the power section is on and enables reference value processing. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E1 00 00 hex		
A901 Global r=3, w=4	**SysQuickstopOut:** Quick stop output of the device controller to the axis(axes). Indicates that the device controller forces a quick stop which is executed by speed control. Reference value processing of the axis must support this with priority before axis reference value processing. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E1 40 00 hex		
A903 Global r=3, w=4	**SysOpenBrake:** Command bit: Open halting brake (X2). This signal bypasses brake control and goes directly to plug connector X2. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E1 C0 00 hex		
A904 Global r=3, w=3	**New PDO1 data for IP:** The parameter is set to "1" when a PDO is received. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 E2 00 00 hex		
A905 Global r=3, w=3	**New PDO1 data for Tx:** The parameter is set to "1" when a PDO is received. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 E2 40 00 hex		
A906 Global r=3, w=3	**Time stamp PDO1:** Time relationship between PDO receipt and cycle time. Fieldbus: 1LSB=1µs; Type: U32; USS-Adr: 01 E2 80 00 hex		
A907 Global r=3, w=3	**Reference timestamp PLL:** Time relationship of PLL to cycle time. Fieldbus: 1LSB=1µs; Type: U16; USS-Adr: 01 E2 C0 00 hex		
A910 Global r=3, w=4	**SysAdditionalEnableIn:** Additional enable signal of the axis to the device controller. A logical AND link with the enable signal (usually from binary input X100.enable) occurs on the device controller. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E3 80 00 hex		
A911 Global r=3, w=4	**SysQuickstopIn:** Quick stop request of the axis to the device controller. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E3 C0 00 hex		
A912 Global r=3, w=4	**SysFaultResetInput:** Fault reset of the axis to the device controller. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E4 00 00 hex		
A913 Global r=3, w=4	**SysQuickstopEndInput:** Quick stop end signal of the axis to the device controller. Indicates that a quick stop was concluded. With applications without braking control, this is usually the "standstill reached" signal. With applications with braking control, this is usually the "brake closed" signal. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E4 40 00 hex		

A.. Inverter			
Par.	**Description**	**Fieldbus-address**	
A915 Global r=3, w=4	**CAN PDO Mode:** This parameter set the PDO communication. Standard application (**A915**=0 - 2 PDO channel) or interpolated positioning (**A915**=1 - 1 PDO channel). The parameter will be set automatically if the application is selected by the configurations assistant. **NOTE** The parameter is only visible when a CAN device controller is selected in the device configuration or the appropriate blocks were used with the option for free, graphic programming. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 01 E4 C0 00 hex		
A916 Global r=3, w=4	**Reference cycle-time:** Cycle time of the SYNC telegram. Is created from **G98**. Fieldbus: 1LSB=1µs; Type: I16; USS-Adr: 01 E5 00 00 hex		
A918 Global r=3, w=4	**SysLocal:** Signal of the device controller to the axis (axes). Indicates that local operation is activated ("hand" key). Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E5 80 00 hex		
A919 Global r=3, w=4	**SysEnableLocal:** Signal of the device controller to the axis (axes). Indicates that local operation ("hand" key) and local enable ("I/O" or "I" key) are activated. Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E5 C0 00 hex		
A922 Global r=2, w=4	**SysControlWordBit4:** Signal of device control on the axis/axes. The function is application-specific. The parameter is only functional for the applications listed below. **Application** — **Meaning** Comfort reference value — Corresponds to the *Stop* signal Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E6 80 00 hex		
A923 Global r=2, w=4	**SysControlWordBit5:** Signal of device control on the axis/axes. The function is application-specific. The parameter is only functional for the applications listed below. **Application** — **Meaning** Comfort reference value — Halt ramp generator (with lower priority than Stop and Quick Stop) Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E6 C0 00 hex		
A924 Global r=2, w=4	**SysControlWordBit6:** Signal of device control on the axis/axes. The function is application-specific. The parameter is only functional for the applications listed below. **Application** — **Meaning** Comfort reference value — Corresponds to the *Stop* signal Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E7 00 00 hex		
A925 Global read (2)	**SysTargetReached:** Signal of the axis to the device control. The reference value was reached. The function is application-specific. The parameter is only functional for the applications listed below. **Application** — **Meaning** Comfort reference value — Reference-value-reached flag, same as **D183** "n-window reached" Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E7 40 00 hex		
A926 Global read (2)	**SysTargetReached:** Signal of the axis to the device control. The reference value was reached. The function is application-specific. The parameter is only functional for the applications listed below. **Application** — **Meaning** Comfort reference value — One of the following signals is active: **D182**, **D185**, **D186**, **D308**, **D309**, **D462** Fieldbus: 1LSB=1; Type: B; USS-Adr: 01 E7 80 00 hex		

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B00 Axis r=1, w=1	**Motor-type:** Indication of the motor name as text. *Default setting: ED303U* Fieldbus: Type: Str16; USS-Adr: 02 00 00 00 hex	2200h	0h
B02 Axis, OFF r=1, w=1	**Back EMF:** Specifies the peak value of induced voltage between two phases at 1000 Rpm. When an effective value is specified for external motors, this must be multiplied by 1.41 before entry in **B02**. *Value range in V/1000rpm: 5.0 ... 60,0 ... 3000.0* Fieldbus: 1LSB=0,1V/1000rpm; Type: I16; (raw value:1LSB=0,1·rpm); USS-Adr: 02 00 80 00 hex 👁 Only with servo operation (**B20** greater or equal to *64:Servo-control*).	2202h	0h
B04 Axis, OFF r=1, w=1	**El. motor-type:** STÖBER motors of the ED/EK series are available with electronic single and multi-turn encoders. These encoders offer a special parameter memory. In all standard models STÖBER places all motor data in this memory including any existing halting brake ("electronic nameplate"). **B04** is only used when **B06**=0 is set. With **B04**=0, only the commutation offset is read. The other motor data can be entered as desired. When **B04**=1 is set, the following parameters are read from the nameplate. **B00**, **B02**, **B05**, **B10**, **B11**, **B12**, **B13**, **B15**, **B16**, **B17**, **B51**, **B52**, **B53**, **B62**, **B64**, **B65**, **B66**, **B67**, **B68**, **B70**, **B71**, **B72**, **B73**, **B74**, **B82**, **B83**, **F06**, **F07** With **B04**=1, the motor data are read from the encoder after each power-on. Any manual changes to motor data are only effective until the next power-off and power-on even when the changes are stored non-volatilely in Paramodule. For permanent changes to the motor data, set **B04**=0. Then store the changes with **A00**=1. Electronic nameplates of other motor manufacturers cannot be evaluated with the MDS 5000. **Note:** Correct evaluation of the electronic nameplate after a change in parameter **B04** is not ensured until after a device new start. *0: Commutation;* *1: All data;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 01 00 00 hex	2204h	0h
B05 Axis, OFF r=1, w=1	**Commutation-offset:** Shift the encoder zero position in comparison to the motor. STÖBER motors with resolvers are set to **B05**=0 at the plant and checked. Normally a change in the **B05** parameter is not required. When phase test **B40** produces a value **B05**>5° or **B05**<355°, a wiring or plug problem is probably the cause. With STÖBER motors with absolute value encoders, the commutation offset is written to the electronic nameplate at the plant and is read by the MDS during "startup." In this case, **B05** is also 0. *Value range in °: 0.0 ... 0,0 ... 360.0* Fieldbus: 1LSB=0,1°; Type: I16; (raw value:32767 = 2879.9 °); USS-Adr: 02 01 40 00 hex 👁 Only with servo operation (**B20** greater or equal to *64:Servo-control*).	2205h	0h
B06 Axis, OFF r=1, w=1	**Motor-data:** STÖBER motors of the ED/EK series are available with electronic single and multi-turn encoders. These encoders offer a special parameter memory. In all standard models STÖBER places the entire motor data in this memory including any existing halting brake ("electronic nameplate"). With **B06**=0, the data set in **B04** are read from the encoder after each power-on. Any manual changes in motor data only remain effective until the next power-off and power-on even when the changes are stored in Paramodule non-volatilely. Set **B06**=1 for motors without electronic nameplates. The default values of the motor data entered in the parameter list must then be checked and adjusted. The commutation offset can be auto-tuned with the action **B40**. The changes must then be stored with **A00**=1. Electronic nameplates of other motor manufacturers cannot be evaluated with the MDS 5000.	2206h	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
	NOTE Up to and including firmware status V 5.2, correct evaluation of the nameplate after a change in parameter **B06** does not occur until a device new start. Starting with firmware status V 5.3, the nameplate is evaluated immediately. The parameter **G06** only appears for inverters of the MDS 5000 series. *0: El. motor-type;* *1: User defined;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 01 80 00 hex 👁 Only when **H00** = *64:EnDat*.		
B10 Axis, OFF r=1, w=1	**Motor-poles:** Results from the nominal speed *nNom* [Rpm] and the nominal frequency *f* [Hz] of the motor. **B10**=2·(*f* · 60 / *nNom*). Correct entry of the number of poles is mandatory for the inverter to function. *Value range: 2 ... 6 ... 16* Fieldbus: 1LSB=1; Type: U8; (raw value:255 = 510); USS-Adr: 02 02 80 00 hex	220Ah	0h
B11 Axis, OFF r=1, w=1	**Nominal motor power:** Nominal power in kW as per nameplate. If only the nominal torque *Mn* is known instead of the nominal power, **B11** must be calculated from *Mn* [Nm] and the nominal speed *n* [Rpm] based on the following formula: **B11**=Mn · n / 9550. *Value range in kW: 0.120 ... 0,440 ... 500.000* Fieldbus: 1LSB=0,001kW; Type: I32; USS-Adr: 02 02 C0 00 hex	220Bh	0h
B12 Axis, OFF r=1, w=1	**Nominal motor current:** Nominal current in A as per nameplate. *Value range in A: 0.001 ... 1,250 ... 327.670* Fieldbus: 1LSB=0,001A; Type: I32; USS-Adr: 02 03 00 00 hex	220Ch	0h
B13 Axis, OFF r=1, w=1	**Nominal motor speed:** Nominal speed in Rpm as per nameplate. *Value range in rpm: 0 ... 6000 ... 95999* Fieldbus: 1LSB=1rpm; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 02 03 40 00 hex	220Dh	0h
B14 Axis, OFF r=1, w=1	**Nominal motor voltage:** Nominal voltage as per nameplate. Since, with asynchronous motors, the type of switching (Y/Δ) must be adhered to, make sure that the parameters **B11** ... **B15** match! *Value range in V: 0 ... 400 ... 480* Fieldbus: 1LSB=1V; Type: I16; (raw value:32767 = 2317 V); USS-Adr: 02 03 80 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	220Eh	0h
B15 Axis, OFF r=1, w=1	**Nominal motor frequency:** Nominal frequency of the motor as per nameplate. Parameters **B14** and **B15** specify the inclination of the V/F characteristic curve and thus the characteristic of the drive. The V/F characteristic curve determines the frequency (**B15**: f-nominal) at which the motor will be operated (**B14**: V-nominal). Voltage and frequency can be linearly increased over the nominal point. Upper voltage limit is the applied network voltage. STÖBER system motors up to a size of 112 offer the possibility of star/delta operation. Delta operation with 400 V permits a power increase by the factor of 1.73 and an expanded speed range with constant torque. In this type of circuit, the motor requires more current. It must be ensured that: - The frequency inverter is designed for the corresponding power ($P_{Delta} = 1.73 \cdot P_{Star}$). - **B12** (I-nominal) is parameterized for the corresponding nominal motor current ($I_{Delta} = 1.73 \cdot I_{Star}$). With quadratic characteristic curve (**B21**=1), nominal frequencies are limited via 124 Hz internally to 124 Hz. *Value range in Hz: 0.0 ... 50,0 ... 1600.0* Fieldbus: 1LSB=0,1Hz; Type: I32; (raw value:2147483647 = 512000.0 Hz); USS-Adr: 02 03 C0 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	220Fh	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B17 Axis, OFF r=1, w=1	**T0 (standstill):** Standstill torque M0 as per nameplate. Used, among others, as reference value for the torque and current limitation (**C03** and **C05**). *Value range in Nm: 0.000 ... 1,410 ... 2147483.647* Fieldbus: 1LSB=0,001Nm; Type: I32; USS-Adr: 02 04 40 00 hex 👁 Only with servo operation (**B20** greater or equal to *64:Servo-control*).	2211h	0h
B18 Axis read (3)	**Related torque:** The parameter **B18** shows the reference value for percentage of torque values (such as **C03**, **C05**, **E62** and **E66**) in every control mode (**B20**). *Value range in Nm: -11.28 ... 1,41 ... 11.28* Fieldbus: 1LSB=0,01Nm; Type: I16; raw value:1LSB=Fnct.no.22; USS-Adr: 02 04 80 00 hex	2212h	0h
B19 Axis, OFF r=1, w=1	**cos (phi):** Cos (phi) as per nameplate. *Value range: 0.500 ... 0,720 ... 1.000* Fieldbus: 1LSB=0,001; Type: I16; USS-Adr: 02 04 C0 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	2213h	0h
B20 Axis, OFF r=3, w=3	**Control mode:** Specifies the type of motor control. **NOTE** - With control type *"0: V/f-control,"* there is **no** current or torque limitation. Similarly, connection to a rotating motor is not possible ("capturing"). - Control type *64:Servo-control* is not available with the FDS 5000 inverter. *0: V/f-control;* Simplest type of control for the asynchronous machine (ASM). The corresponding reference value frequency and voltage are calculated from the specified speed and rigidly applied to the motor. *1: Sensorless vector control;* *2: Vector control;* *64: Servo-control*; Type of control for servo drives. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 05 00 00 hex	2214h	0h
B21 Axis, OFF r=1, w=1	**V/f-characteristic:** Switch between linear and square characteristic curve. *0: Linear;* Voltage/frequency characteristic curve is linear. Suitable for all applications. *1: Square;* Square characteristic curve for use with fans and pumps. The characteristic curve is continued linearly starting at the nominal frequency (**B15**). Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 05 40 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	2215h	0h
B22 Axis r=1, w=1	**V/f-factor:** Offset factor for the increase of the V/f characteristic curve. The increase with V/F factor = 100% is specified by V-nominal (**B14**) and f-nominal (**B15**). *Value range in %: 90 ... 100 ... 110* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 02 05 80 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	2216h	0h
B23 Axis r=1, w=1	**V/f-Boost:** The term boost means an increase in voltage in the lower speed range whereby a higher startup torque is available. With a boost of 100% the nominal motor current flows at 0 Hz. To specify the required boost voltage, the stator resistance of the motor must be known. For this reason, with motors without electronic nameplate, it is essential that **B41** (autotune motor) be performed!! With STÖBER standard motors, the stator resistance of the motor is specified by the choice of motor. *Value range in %: 0 ... 10 ... 400* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 02 05 C0 00 hex 👁 Only with V/f control (**B20**=0).	2217h	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B24 Axis r=2, w=2	**Switching frequency:** The noise volume of the drive is affected by changing the switching frequency. Increasing the switching frequency increases losses, however. For this reason, the permissible nominal motor current (**B12**) must be reduced when the switching frequency is increased. With operation of a servo motor (**B20**=64), at least 8 kHz must be set. With a setting of 4 kHz, an internal switch to 8 kHz is performed for servo operation. In some operating states, the switching frequency is changed by the inverter itself. The currently active switching frequency can be read in **E151**. **NOTE** The factory setting of this parameter depends on **B20.** With a servo controller, the value *8:8kHz* is entered in **B24**. When an asynchronous machine (V/f controller, sensorless vector controller and vector controller) is used, **B24** has the value *4:4kHz*. *4: 4kHz;* *8: 8kHz;* *16: 16kHz;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 06 00 00 hex	2218h	0h
B25 Axis, OFF r=2, w=2	**Halt flux: B25** specifies whether the motor with applied brakes remains electrified during halt and quick stop. Particularly useful for positioning. After a HALT, the motor remains fully electrified for the time **B27**. After expiration of this time, the electrification is lowered to the level specified in **B25**. When *0%* is the setting and the brake is applied (halt, quick stop), the motor goes dead and the flux is canceled. The advantage is a better thermal motor balance since the motor can cool off during the pause times. The disadvantage is the additional time for establishment of magnetization (rotor time constant, approx. 0.5 sec). The required time is determined automatically by the inverter and added to brake release time **F06**. *Value range in %: 0 ... 100 ... 100* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 02 06 40 00 hex	2219h	0h
B26 Axis, OFF r=1, w=1	**Motor encoder:** Selection of the interface to which the motor encoder is connected. The encoder must be correctly parameterized in **H..** for the particular interface (see encoder list in the **H..** group). **NOTE** Remember that the interfaces X120 and X140 are only available on the MDS 5000. The settings *3:X140-Resolver* and *4:X120-Encoder* do not exist on the FDS 5000. *0: inactive;* *1: BE-encoder;* An incremental encoder which is connected to terminals BE4 and BE5 is used as motor encoder. The exact parameterization of the encoder must be performed in **H10** ... **H12**. *2: X4-encoder;* The motor encoder is connected to interface X4. The exact parameterization of the encoder must be performed in **H00** ... **H02**. *3: X140 resolver;* A resolver on the optional interface **X140** is used as motor encoder. The exact parameterization of the encoder must be performed in **H30** ... **H32**. *4: X120-encoder;* The motor encoder is connected to the optional interface **X120**. The precise parameterization of the encoder must be performed in **H120** to **H126**. **Note:** The interface **X120** is only available with the "I/O terminal module, expanded (XEA 5000)" and "I/O terminal module, expanded (XEA 5001)" respectively! Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 06 80 00 hex	221Ah	0h
B27 Axis, OFF r=2, w=2	**Time halt-flux:** In case of a reduced halt flux **B25**, the applied brake and active power pack of the full magnetization current is still maintained for the time **B27**. *Value range in s: 0 ... 0 ... 255* Fieldbus: 1LSB=1s; Type: U8; USS-Adr: 02 06 C0 00 hex	221Bh	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B28 Axis, OFF r=2, w=2	**Encoder gearfactor:** When the encoder for motor control for setting **B20**=2 (control type = vector control) is not mounted directly on the motor shaft, the gear ratio between motor shaft and the encoder must be specified here. It must apply: • **B28** = Number of motor revolutions/number of encoder revolutions. • An SSI or an incremental encoder must be used. **B28** can also assume negative values. Values whose amount is less than 1/10 may not be set. When **B28** is not equal to 1.000, **E09** indicates the encoder position and not the rotor position. *Value range: -32.000 ... 1,000 ... 31.999* Fieldbus: 1LSB=0,001; Type: I16; (raw value:10 Bit=1); USS-Adr: 02 07 00 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	221Ch	0h
B29 Axis r=3, w=4	**Tolerate overcurrent:** With applications which run close to the overcurrent threshold of the inverter, normal control procedures can cause undesired overcurrent malfunctions. For these cases, the parameter **B29** makes it possible to tolerate a crossing of the overcurrent threshold for an adjustable number of current controller cycles. The parameter should **not** be changed **until** after the max. current value has been checked with an external current measuring instrument. **CAUTION** With **B20** = *0:V/f-control* and **B20**=*1:sensorless vector control*, **B29** must be 0! *Value range in current-ctrl cycles: 0 ... 0 ... 20* Fieldbus: 1LSB=1current-ctrl cycles; Type: I8; USS-Adr: 02 07 40 00 hex	221Dh	0h
B30 Axis r=3, w=3	**Additional motor-operation:** Only possible with **B20**=0 (V/f control). For multi-motor operation. Permits the connection of an additional motor on the enabled inverter. This briefly reduces motor voltage to prevent an overcurrent switch-off. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 02 07 80 00 hex 👁 Only with V/f control (**B20**=0).	221Eh	0h
B31 Axis, OFF r=3, w=3	**Oscillation damping:** Large motors can have a tendency to sympathetic vibration during no load. Increasing parameter **B31** damps these vibrations with **B20**=*2*:SLVC. Values from 60 ... 100% are suitable for problematic drives. *Value range in %: 0 ... 30 ... 100* Fieldbus: 1LSB=1%; Type: I16; (raw value:256·LSB=100%); USS-Adr: 02 07 C0 00 hex	221Fh	0h
B32 Axis, OFF r=3, w=3	**SLVC-dynamics:** The reaction speed of the SLVC to changes in load can be influenced by **B32**. The highest dynamics are **B32**=100%. *Value range in %: 0 ... 70 ... 100* Fieldbus: 1LSB=1%; Type: I16; (raw value:256·LSB=100%); USS-Adr: 02 08 00 00 hex	2220h	0h
B35 Axis r=3, w=3	**Offset raw-motorencoder:** The parameter **B35** is added to the encoder raw value or accumulated encoder raw value. The results are indicated in **E154** raw motor-encoder and **E153** accumulated raw-motor-encoder. The scaling of **B35** depends on the motor encoder being used: - EnDat®, SSI: MSB = 2048 encoder revolutions - Resolver: 65,536 LSB = 1 encoder revolution (i.e., MSB = 32,768 encoder revolutions) - Incremental encoder: 4 LSB = 1 increment MSB = Most Significant Bit LSB = Least Significant Bit Fieldbus: 1LSB=1; Type: U32; USS-Adr: 02 08 C0 00 hex	2223h	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B36 Axis, OFF r=3, w=3	**Maximum magnetisation:** The parameter permits the motor to move within the basic speed range with reduced magnetization. With a light load, this can be used to reduce heatup of motor and inverter. The parameter should usually be set to 100% (no reduction). **NOTE** The parameter is only effective in control type **B20**= *2:Vectorcontrol*. *Value range in %: 50 ... 100 ... 100* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 02 09 00 00 hex	2224h	0h
B40.0 Global r=2, w=2	**Phase test & start:** Writing a one starts the *phase test* action. It may only be used for servo motors. A check is made to determine whether phases were mixed up when the motor was connected, whether the number of motor poles (**B10**) is correct and auto-tunes the commutation offset (**B05**). During the action the motor must be able to revolve freely. The enable must be LOW at the starting point. After **B40**.0=1 the enable must be switched HIGH. After the action was executed, the enable must be switched back to LOW. The result of the action can be read after removal of the enable in **B05**. During this action the cycle time is internally set to 32 ms. The switch is made when the action is activated. **WARNING** Starting the action releases the motor brake. Since, due to the action, the motor is not sufficiently energized, it is unable to carry any loads (e.g., in a lifting system). For this reason the action may only be performed with motors which are not installed in a system. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A 00 00 hex	2228h	0h
B40.1 Global read (2)	**Process:** Progress of the phase test in %. Fieldbus: 1LSB=1%; Type: U8; USS-Adr: 02 0A 00 01 hex	2228h	1h
B40.2 Global read (2)	**Result:** After conclusion of the phase test action, the result can be queried here. *0: error free;* *1: aborted;* *2: phase order;* *3: motor poles;* *4: commutation offset;* *5: test run;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A 00 02 hex	2228h	2h
B41.0 Global r=2, w=2	**Autotuning & start:** Writing a one starts the *Autotune motor* action. It measures the resistance (**B53**) and the inductivity (**B52**) of the motor. The drive may move during this action. The enable must be LOW at the starting point. After **B41**.0=1, the enable must be switched to HIGH. After the action is executed, the enable must be switched back to LOW. The result of the action can be read in **B52**, **B53** after the enable is removed. During this action the cycle time is internally set to 32 ms. The switch is made when the action is activated. When an asynchronous machine (**B20**<64) is being used, the action also autotunes the values for **B54** leakage factor and **B55** saturation coefficient. **WARNING** Starting the action releases the motor brake. Since, due to the action, the motor is not sufficiently energized, it is unable to carry any loads (e.g., in a lifting system). For this reason the action may only be performed with motors which are not installed in a system. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A 40 00 hex	2229h	0h
B41.1 Global read (2)	**Process:** Progress of autotuning the motor in %. Fieldbus: 1LSB=1%; Type: U8; USS-Adr: 02 0A 40 01 hex	2229h	1h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B41.2 Global read (2)	**Result:** After conclusion of the *Autotune motor* action, the result can be queried. *0: error free;* *1: aborted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A 40 02 hex	2229h	2h
B42.0 Global r=2, w=2	**Optimize current controller & start:** Writing a one starts the *Optimize current controller* action. This re-specifies the parameters for current controller gain (**B64** ... **B68**). During the action, the drive revolves at approx. 2000 Rpm and may make clicking noises at regular intervals. The action may take up to approx. 20 minutes. The result of the action can be read in **B64** ... **B68** after the enable is removed. When the action is enabled on the device during local operation, the action can only be terminated with a very long delay. During this action the cycle time is internally set to 32 ms. The switch is made when the action is activated. **WARNUNG** Starting the action releases the motor brake. Since, due to the action, the motor is not sufficiently energized, it is unable to carry any loads (e.g., in a lifting system). For this reason the action may only be performed with motors which are not installed in a system. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A 80 00 hex	222Ah	0h
B42.1 Global read (2)	**Process:** Progress of the current controller optimization %. Fieldbus: 1LSB=1%; Type: U8; USS-Adr: 02 0A 80 01 hex	222Ah	1h
B42.2 Global read (2)	**Result:** After conclusion of the current controller optimization action, the result can be queried here. *0: error free;* *1: aborted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A 80 02 hex	222Ah	2h
B43.0 Global r=2, w=2	**Winding test & start:** Writing a one starts the *Winding test* action. This checks the symmetry of the ohmic resistances of the motor windings. The enable must be LOW at the starting point. After **B43**.0=1, the enable must be switched to HIGH. After the action is executed, the enable must be switched back to LOW. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A C0 00 hex	222Bh	0h
B43.1 Global read (2)	**Process:** Progress of the winding test in %. Fieldbus: 1LSB=1%; Type: U8; USS-Adr: 02 0A C0 01 hex	222Bh	1h
B43.2 Global read (2)	**Result:** After conclusion of the winding test action, the result can be queried. *0: error free;* *1: aborted;* *2: R_SYM_U;* *3: R_SYM_V;* *4: R_SYM_W;* *5: POLAR_SYM_U;* *6: POLAR_SYM_V;* *7: POLAR_SYM_W;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 02 0A C0 02 hex	222Bh	2h
B52 Axis, OFF r=2, w=2	**Stator inductance:** Inductance Lu-v of the motor winding in mH. Enter only for external motors. The value can be autotuned with the **B41** action. *Value range in mH: 0.001 ... 17,750 ... 2147483.647* Fieldbus: 1LSB=0,001mH; Type: I32; USS-Adr: 02 0D 00 00 hex	2234h	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B53 Axis, OFF r=2, w=2	**Stator winding resistance:** Stator winding resistance Ru-v of the motor winding in ohm. Enter only for external motors. The value can be autotuned with the **B41** action. *Value range in Ohm: 0.001 ... 10,300 ... 2147483.647* Fieldbus: 1LSB=0,001Ohm; Type: I32; USS-Adr: 02 0D 40 00 hex	2235h	0h
B54 Axis, OFF r=3, w=3	**Leakage factor:** Ratio of leakage inductance to total inductance "Ls" of the motor **NOTE** The default value is sufficient for most motors and applications. Adjustments may become necessary when an external motor is connected. In such cases the value can be autotuned with the action **B41**. However, do not make this adjustment before consulting with STÖBER ANTRIEBSTECHNIK GmbH & Co. KG. *Value range: 0.010 ... 0,100 ... 0.300* Fieldbus: 1LSB=0,001; Type: I16; USS-Adr: 02 0D 80 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	2236h	0h
B55 Axis, OFF r=3, w=3	**Magnetic saturation coefficient:** The parameter specifies how much the motor is magnetically saturated at the nominal point. The parameter is important for the control accuracy of control type VC (**B20**=2:*VC*) in the field weakening area. **NOTE** The default value is sufficient for most motors and applications. Adjustments may become necessary when an external motor is connected. In such cases the value can be autotuned with the action **B41**. However, do not make this adjustment before consulting with STÖBER ANTRIEBSTECHNIK GmbH & Co. KG. *Value range: 0.000 ... 0,750 ... 0.950* Fieldbus: 1LSB=0,001; Type: I32; (raw value:2147483647 = 32767.000); USS-Adr: 02 0D C0 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	2237h	0h
B61 Axis, OFF r=2, w=2	**T-Motor (thermal):** Time constant of motor heatup in seconds. *Value range in s: 0.1 ... 1040,0 ... 3276.7* Fieldbus: 1LSB=0,1s; Type: I16; USS-Adr: 02 0F 40 00 hex	223Dh	0h
B62 Axis, OFF r=2, w=2	**Motor inertia:** Inertia *J* of the motor in kg cm². *Value range in kg cm2: 0.0001 ... 0,4151 ... 214748.3647* Fieldbus: 1LSB=0,0001kg cm2; Type: I32; (raw value:1LSB=0,0001); USS-Adr: 02 0F 80 00 hex	223Eh	0h
B63 Axis, OFF r=3, w=3	**Mmax/Mnom:** Relationship of breakdown torque of the motor to its nominal torque. *Value range: 1.0 ... 2,5 ... 8.0* Fieldbus: 1LSB=0,1; Type: I16; (raw value:32767 = 8.0); USS-Adr: 02 0F C0 00 hex 👁 Only with asynchronous machines (**B20** less than *64:Servo-control*).	223Fh	0h
B64 Axis r=3, w=3	**Integral time Iq:** Integral time of the current controller for the torque-generating share in msec. A setting under 0.6 msec causes an integral gain of 0 (corresponds to an infinite integral time). *Value range in ms: 0.0 ... 1,4 ... 100.0* Fieldbus: 1LSB=0,1ms; Type: I16; USS-Adr: 02 10 00 00 hex 👁 Only with control types with current control (**B20** = *64:Servo* or *2:VC*).	2240h	0h
B65 Axis r=3, w=3	**Proportional gain torque controller:** Proportional gain of the torque controller. *Value range in %: 0.0 ... 50,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 02 10 40 00 hex 👁 Only with control types with current control (**B20** = *64:Servo* or *2:VC*).	2241h	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B66 Axis r=3, w=3	**Integral time Id:** Integral time of the current controller for the flow-generating share in msec. A setting under 0.6 msec causes an integral gain of 0 (corresponds to an infinite integral time). *Value range in ms: 0.0 ... 1,4 ... 100.0* Fieldbus: 1LSB=0,1ms; Type: I16; USS-Adr: 02 10 80 00 hex 👁 Only when **B20** is not *0:V/f-control*.	2242h	0h
B67 Axis r=3, w=3	**Proportional gain flux:** Proportional gain of the flow controller. *Value range in %: 0.0 ... 25,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 02 10 C0 00 hex 👁 Only when **B20** is not *0:V/f-control*.	2243h	0h
B68 Axis r=3, w=3	**Kd-iq:** D share of the torque controller. *Value range in %: 0.0 ... 14,5 ... 595.8* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=595,8%); USS-Adr: 02 11 00 00 hex 👁 Only when **B20** is not *0:V/f-control*.	2244h	0h
B70 Axis, OFF r=3, w=3	**TW:** Thermal time constant of the winding. *Value range in s: 0.01 ... 140,00 ... 327.67* Fieldbus: 1LSB=0,01s; Type: I16; USS-Adr: 02 11 80 00 hex	2246h	0h
B72 Axis, OFF r=3, w=3	**TH:** Is used for the thermal motor model. The parameter specifies in % the ratio of housing temperature and winding temperature at steady thermal factor. Example: During stationary operation at nominal point, the housing has a temperature of 110 °C, the winding 150 °C, and the ambient temperature is 25 °C. This results in: **B72** = (110°C-25°C) / (150°C-25°C) * 100% = 68%. *Value range in %: 5.0 ... 66,7 ... 95.0* Fieldbus: 1LSB=0,1%; Type: I32; (raw value:409600·LSB=100%); USS-Adr: 02 12 00 00 hex	2248h	0h
B73 Axis, OFF r=3, w=3	**tr0:** Specifies the speed-independent friction of the motor. *Value range in Nm: -32.768 ... 0,060 ... 32.767* Fieldbus: 1LSB=0,001Nm; Type: I16; USS-Adr: 02 12 40 00 hex	2249h	0h
B74 Axis, OFF r=3, w=3	**tr1:** Specifies the speed-dependent friction of the motor. *Value range in Nm/1000rpm: -3.2768 ... 0,0150 ... 3.2767* Fieldbus: 1LSB=0,0001Nm/1000rpm; Type: I16; (raw value:1LSB=0,0001·rpm); USS-Adr: 02 12 80 00 hex	224Ah	0h
B82 Axis, OFF r=2, w=2	**I-max:** Maximum current before the motor is de-magnetized. Specification in A. *Value range in A: 0.000 ... 7,480 ... 2147483.647* Fieldbus: 1LSB=0,001A; Type: I32; USS-Adr: 02 14 80 00 hex	2252h	0h
B83 Axis, OFF r=2, w=2	**n-max motor:** Maximum permissible speed for the motor. Specification in Rpm. *Value range in rpm: 0 ... 8000 ... 17 Bit* Fieldbus: 1LSB=1rpm; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 02 14 C0 00 hex	2253h	0h
B295 Global read (3)	**Double transmission motor-encoder:** Indicates whether double transmission monitoring is active for the SSI encoder used as the motor encoder. Evaluation of the encoder begins without double transmission monitoring but double transmission monitoring is automatically activated after a short time if the SSI encoder being used supports this. When monitoring is inactive, data security is reduced significantly. If the motor encoder is not an SSI encoder, the parameter has no meaning. **NOTE** The parameter can only be used when an SSI encoder is evaluated on the inverter. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 02 49 C0 00 hex	2327h	0h

B.. Motor			
Par.	**Description**	**Fieldbus-address**	
B296 Global read (3)	**Error-counter motor-encoder:** Counts the number of tolerable errors of the motor encoder since the last device new start. **NOTE** The parameter can only be used when an SSI or EnDat® encoder is evaluated on the inverter. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 02 4A 00 00 hex	2328h	0h
B297 Axis r=3, w=3	**Maximum-speed motorencoder: B297** can be used for a plausibility check of the motor encoder signals for EnDat® and SSI encoders. The difference between two consecutive encoder values is monitored. If this difference exceeds the speed specified in **B297**, a fault is triggered (37:n-feedback / double transmission, starting with V5.2: 37:Encoder / X4-speed or X120-speed). **NOTE** The parameter can only be used when an SSI or EnDat® encoder is evaluated on the inverter. *Value range in rpm: 0 ... <u>131071</u> ... 17 Bit* Fieldbus: 1LSB=1rpm; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 02 4A 40 00 hex	2329h	0h
B298 Axis r=3, w=3	**Error-tolerance motorencoder:** Sets the tolerance of the inverter to errors of the motor encoder. This tolerance can be used to prevent a fault 37:Encoder when encoder errors occur sporadically. The inverter extrapolates an encoder value in this case. The parameter **B298** specifies how many errors will be tolerated before the inverter malfunctions. Error evaluation is structured as shown below: Each arriving encoder value is checked. When an encoder error is determined, **B299** and **B298** are compared. If the error evaluation counter **B299** is greater than or equal to **B298**, fault 37: Encoder is triggered. If **B299** is less than **B298**, the error is tolerated. The counter status **B299** is incremented by 1.0. If the arriving encoder value is correct, the error evaluation counter **B299** is decremented by 0.1. Decrementation continues until the value 0 is reached. Example: When 0.1 is set in **B298**, one error is tolerated but there must be at least 10 correct values before the next error is determined. The following errors are tolerated: - EnDat®-CRC - EnDat®-Busy - SSI-double transmission - SSI-Busy - Violation of the maximum speed in **B297** With other encoder errors (e.g., wire break), a fault is triggered immediately regardless of **B298**. Error tolerance may negatively affect the quality of movement. The wiring should be checked when encoder errors occur frequently. **NOTE** The parameter can only be used when an SSI or EnDat® encoder is evaluated on the inverter. *Value range: 0.0 ... <u>1,0</u> ... 3.0* Fieldbus: 1LSB=0,1; Type: I8; USS-Adr: 02 4A 80 00 hex	232Ah	0h
B299 Global read (3)	**Error-evaluation motorencoder:** Shows the current status of the error evaluation counter (see **B298**). **NOTE** The parameter can only be used when an SSI or EnDat® encoder is evaluated on the inverter. Fieldbus: 1LSB=0,1; Type: I8; USS-Adr: 02 4A C0 00 hex	232Bh	0h

C.. Machine			
Par.	**Description**	**Fieldbus-address**	
C01 Axis r=2, w=2	**n-max:** Maximum permissible speed. The speed is related to the motor shaft speed. When **C01***1.1 + 100 Rpm is exceeded, the inverter assumes fault *"56:Overspeed."* **C01** may not exceed the maximum permissible motor speed **B83**. Für Positionierapplikation wird die n-Vorsteuerung auf **C01** begrenzt. *Value range in rpm: 0 ... 3000 ... 17 Bit* Fieldbus: 1LSB=1rpm; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 03 00 40 00 hex	2401h	0h
C03 Axis r=1, w=1	**Max-positive Torque:** Positive maximum torque in % of motor standstill torque M0 with servo motors and nominal torque Mn for asynchronous motors. If the maximum torque is exceeded, the controller reacts with the message *"47:M-MaxLimit."* Depending on the operational status and the configuration being used, the actual, active, positive, maximum torque may differ from **C03**. The active, positive maximum torque can be monitored in **E62**. See also **E22** and **C06** (if present). *Value range in %: 0 ... 150 ... 750* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 03 00 C0 00 hex	2403h	0h
C05 Axis r=1, w=1	**Max-negative Torque:** Positive maximum torque in % of motor standstill torque M0 with servo motors and nominal torque Mn for asynchronous motors. When the maximum torque is exceeded, the controller reacts with the message *"47:M-MaxLimit."* Depending on the operational state and the configuration being used, the actual, active, negative maximum torque may differ from **C05**. The active, negative, maximum torque can be monitored in **E66**. See also **E22** and **C06** (if present). *Value range in %: -750 ... -150 ... 0* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 03 01 40 00 hex	2405h	0h
C06 Axis r=2, w=2	**Factor torque limit:** Weighting factor for the torque limits. The reference value can be selected for most standard applications via **C130.** When the parameterized torque limits **C03**, **C05** specify other limit values, the smaller value becomes the active torque limit. **C06** must be increased for some standard applications to allow torques over 200% to take effect in **C03**, **C05**. *Value range in %: 0.0 ... 200,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 03 01 80 00 hex	2406h	0h
C08 Axis r=2, w=2	**Quick stop torque limit:** Quick stop causes the inverter to switch to the torque limit set in **C08**. The limits specified in **C03**, **C05** or other limits specified by the application are ignored during the quick stop. However, the effective torque limit can be automatically reduced if an operating limit of the inverter or the motor would be violated otherwise. *Value range in %: 0 ... 150 ... 750* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 03 02 00 00 hex	2408h	0h
C10.0 Axis r=1, w=3	**Skip delta:** Four skipped areas can be defined with the parameters in **C10**.X and **C11**.X. The reference point of the skipped area is specified in **C11**.X. Half the width to be skipped is parameterized in **C10**.X. The total skipped area is calculated from **C11**.X - **C10**.X and **C11**.X + **C10**.X. The array parameters **C10**.X and **C11**.X are coupled via the same array elements. The skipped area **C10**.3 belongs to reference value **C11**.3. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 80 00 hex	240Ah Array	0h
C10.1 Axis r=1, w=3	**skip delta** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 80 01 hex	240Ah Array	1h

C.. Machine			
Par.	**Description**	**Fieldbus-address**	
C10.2 Axis r=1, w=3	**skip delta** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 80 02 hex	240Ah Array	2h
C10.3 Axis r=1, w=3	**skip delta** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 80 03 hex	240Ah Array	3h
C11.0 Axis r=1, w=3	**Skip speed:** Four skipped areas can be defined with the parameters in **C10**.X and **C11**.X. The reference point of the skipped area is specified in **C11**.X. Half the width to be skipped is parameterized in **C10**.X. The total skipped area is calculated from **C11**.X - **C10**.X and **C11**.X + **C10**.X. The array parameters **C10**.X and **C11**.X are coupled via the same array elements. The skipped area **C10**.3 belongs to reference value **C11**.3. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 C0 00 hex	240Bh Array	0h
C11.1 Axis r=1, w=3	**skip speed** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 C0 01 hex	240Bh Array	1h
C11.2 Axis r=1, w=3	**skip speed** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 C0 02 hex	240Bh Array	2h
C11.3 Axis r=1, w=3	**skip speed** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 03 02 C0 03 hex	240Bh Array	3h
C20 Axis, OFF r=3, w=3	**Startup Mode:** Specifies the startup behavior of the drive. *0: normal;* Default setting *1: load start;* For machines with increased break away torque. During the time time-load start (**C22**), the motor torque is increased to torque load start (**C21**) and the speed is controlled with a sixteenth of the current ramp. *2: cycle characteristic;* A torque pre-control is performed, i.e. the inverter calculates the required torque from the specified motor-type (**B00**) and the ratio of the inertias J-load/J-motor (**C30**). This calculated torque is impressed on the drive. Forward feed is only calculated for acceleration or deceleration procedures. When reference value changes are less than the used ramp or the drive is in static operation, forward feed is deactivated. This provides a tolerance to reference value noise. *3: capturing;* A turning motor is connected to the inverter. The inverter determines the actual speed of the motor, synchronizes itself and specifies the appropriate reference value. *4: cycle characteristic 2;* A torque forward feed is performed with the setting *2:cycle characteristic* (i.e., the inverter calculates the required torque from the specified motor type (**B00**) and the inertia ratio of load/motor (**C30**). This calculated torque is impressed on the drive. In comparison to *2:cycle characteristic*, the drive tends to vibrate with this setting. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 03 05 00 00 hex	2414h	0h
C21 Axis, OFF r=3, w=3	**Torque load start:** Only when **C20**=1 (load start). Specification of the torque for the difficult startup. *Value range in %: 0 ... 100 ... 400* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 03 05 40 00 hex	2415h	0h

C.. Machine			
Par.	**Description**	**Fieldbus-address**	
C22 Axis, OFF r=3, w=3	**Time load start:** Only when **C20**=1. Time for the difficult startup with the torque defined under **C21**. *Value range in s: 0.0 ... 5,0 ... 10.0* Fieldbus: 1LSB=0,1s; Type: I16; (raw value:32767 = 32.8 s); USS-Adr: 03 05 80 00 hex	2416h	0h
C30 Axis r=2, w=3	**J-load/J-motor:** Ratio of the mass inertia of load to motor. In positioning applications **C30** is used to determine the *torque feedforward*. A theoretic torque reference value calculated from the mass to be accelerated is applied to the torque reference value generated by the speed controller. The standard deviations during the acceleration phases are significantly reduced by this. The torque forward feed causes very "hard" movements and can create a vibration excitation in the mechanics. For this reason, we recommend only entering **C30** when actually needed and remaining accordingly below the calculated value. *Value range: 0.0 ... 0,0 ... 512.0* Fieldbus: 1LSB=0,1; Type: I16; (raw value:32767 = 512.0); USS-Adr: 03 07 80 00 hex	241Eh	0h
C31 Axis r=2, w=2	**Proportional gain n-controller:** Proportional gain of the speed controller. With **C31**=100% and a speed deviation of 32 Rpm, the P-share of the speed controller supplies the standstill moment M0 as reference value to the current or torque controller. *Value range in %: 0.0 ... 10,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 03 07 C0 00 hex 👁 Only with control types with current control (**B20** = *64:Servo* or *2:VC*).	241Fh	0h
C32 Axis r=2, w=2	**Integral time n-controller:** Time constant of the I share in speed controller. A short integral time causes a high integration speed and thus increases the "static rigidity" of the drive. With dynamic processes, a short integral time can cause overswinging in the target position. In this case, increase **C32**. The I-controller is deactivated with **C32**<1 msec. At **C31**=100% and a speed deviation of 32 Rpm, the I share of the speed controller supplies the nominal motor torque for the current or speed torque controller precisely after the integral time **C32**. *Value range in ms: 0.0 ... 50,0 ... 3276.7* Fieldbus: 1LSB=0,1ms; Type: I16; USS-Adr: 03 08 00 00 hex 👁 Only with control types with current control (**B20** = *64:Servo* or *2:VC*).	2420h	0h
C33 Axis r=3, w=3	**Low pass reference speed:** Reference value smoothing. **C33** should be increased in case of reference value noise, vibrating mechanics or large external masses. *Value range in ms: 0.0 ... 0,0 ... 500.0* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.12; USS-Adr: 03 08 40 00 hex	2421h	0h
C34 Axis r=2, w=2	**n-motor low pass:** Smoothing time constant for the measured motor speed in msec. Any noise during the measurement of the motor speed causes disagreeable noise and an additional thermal motor load. **C34** helps to reduce speed noise and thus improve the smoothness of running. **C34** should be kept as low as possible since an increase of **C34** reduces the achievable controller gain **C31** and thus the dynamics. *Value range in ms: 0.0 ... 0,8 ... 10.0* Fieldbus: 1LSB=0,1ms; Type: I16; raw value:1LSB=Fnct.no.6; USS-Adr: 03 08 80 00 hex	2422h	0h
C36 Axis r=2, w=2	**Reference torque low pass:** Smoothing time constant for the torque reference value on the output of the speed controller in msec. Is used to suppress vibration and resonance. The effect of torque smoothing is dosed with **C37**. *Value range in ms: 0.0 ... 1,0 ... 40.0* Fieldbus: 1LSB=0,1ms; Type: I16; raw value:1LSB=Fnct.no.5; USS-Adr: 03 09 00 00 hex 👁 Only with control types with current control (**B20** = *64:Servo* or *2:VC*).	2424h	0h

C.. Machine			
Par.	**Description**	**Fieldbus-address**	
C37 Axis r=3, w=3	**Reference torque filter:** The torque reference value is generated on the output of the speed controller from two components whose relationship is affected by **C37**. • Direct output of the PI speed controller (share corresponds to 100%-**C37**). • Smoothed output of PI speed controller (share corresponds to **C37**). For maximum dynamics, set **C37**=0%. The reference value low pass is cancelled out with the time constant **C36**. **C37** can be increased to 100% to attenuate the vibrations. *Value range in %: 0 ... 25 ... 100* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=100%); USS-Adr: 03 09 40 00 hex 👁 Only with control types with current control (**B20** = *64:Servo* or *2:VC*).	2425h	0h
C40 Axis r=2, w=2	**n-window:** With applications without brake control (e.g., fast reference value), "standstill reached" is valid within a window of ±**C40**. This signal means "quick stop concluded" for the device controller. *Value range in rpm: -8191 ... 30 ... 8191* Fieldbus: 1LSB=1rpm; Type: I16; (raw value:32767 = 8191 rpm); USS-Adr: 03 0A 00 00 hex	2428h	0h
C61 Axis r=3, w=3	**Speed limiter:** Switches the speed limiter on. The inverter then still only limits the maximum speed and is in torque mode. *0: inactive;* Normal speed control (possible with higher-level position control, see **C62**). *1: active;* Torque control with speed limiter. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 03 0F 40 00 hex 👁 Only with control types with current control (**B20** = *64:Servo* or *2:VC*).	243Dh	0h
C62 Axis r=3, w=3	**Position ctrl:** Switch position control on and off. Position control is used, for example, for positioning or precise-angle synchronous operation. With all positioning applications (also without encoder), **C62**=1 is required. *0: inactive*; *1: active*; position control Fieldbus: 1LSB=1; Type: U8; USS-Adr: 03 0F 80 00 hex	243Eh	0h
C130 Axis, OFF r=2, w=2	**Torque limit source:** Selection of the source for the signal of the external torque limit "M-Max." It can be permanently specified that the signal is supplied by the analog inputs or the fieldbus. With **C130**=*4:Parameter*, the (global) parameter **C230** is used as the signal source. The resulting torque limit is indicated in **C330**. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 03 20 80 00 hex	2482h	0h
C131 Axis, OFF r=2, w=2	**Torque limit 2 source:** The source of the signal *torque limit 2* is set in **C131**. When there is an absolute torque limit, *torque limit 2* is used as the second limit. When a binary signal (**D110**) is used, you can switch between the sources selected in **C130** and **C131** and a hard startup can be implemented. With the setting **C131** = *4:parameter*, the parameter **C231** is used as the source. It can be written by fieldbus. The current value of the signal can be viewed in **C331** regardless of the source selected. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 03 20 C0 00 hex	2483h	0h

C.. Machine			
Par.	**Description**	**Fieldbus-address**	
C132 Axis, OFF r=2, w=2	**Torque limit motoring source:** In contrast to absolute torque limitation, a maximum motor and generator torque can be specified with speed control. The source of the maximum motor torque is selected in **C132**. **C232** is read in the setting *4:parameter*. This parameter can be written in fieldbus mode. The current value of the signal *torque limit motoring* can be viewed in **C332** regardless of the selected source. **NOTE** The motor and generator torque limitation is active when the display parameters **C332** and **C333** have a value other than zero. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 03 21 00 00 hex	2484h	0h
C133 Axis, OFF r=2, w=2	**Torque limit generating source:** In contrast to absolute torque limitation, a maximum motor and generator torque can be specified with speed control. The source of the maximum generator torque is selected in **C133**. **C233** is read in the setting *4:parameter*. This parameter can be written in fieldbus mode. The current value of the signal *torque limit generating* can be viewed in **C333** regardless of the selected source. **NOTE** The motor and generator torque limitation is active when the display parameters **C332** and **C333** have a value other than zero. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 03 21 40 00 hex	2485h	0h
C230 Global r=2, w=2	**Torque limit:** Specification for the torque limit (absolute value) via fieldbus if the signal source is **C130**=*4:Parameter*. *Value range in %: -200 ... 150 ... 200* Fieldbus: 1LSB=1%; PDO ; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 39 80 00 hex	24E6h	0h
C231 Global r=2, w=2	**Torque limit 2:** When an absolute torque limit is used, *torque limit 2* is used as the second limit. When a binary signal (**D110**) is used, you can switch between the sources selected in **C130** and **C131** and a hard startup can be implemented. The parameter **C231** is used as the source with the setting **C131** = *4:parameter*. It can be written via fieldbus. The current value of the signal can be viewed in **C331** regardless of the selected source. *Value range in %: -200 ... 200 ... 200* Fieldbus: 1LSB=1%; PDO ; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 39 C0 00 hex	24E7h	0h
C232 Global r=2, w=2	**Torque limit motoring:** In contrast to absolute torque limitation, a maximum motor and generator torque can be specified with speed control. **C232** is read with the setting **C132** = *4:Parameter.* This parameter can be written in fieldbus mode. The current value of the signal *torque limit motoring* can be viewed in **C332** regardless of the selected source. **NOTE** The motor and generator torque limitation is active when the display parameters **C332** and **C333** have a value other than zero. *Value range in %: 0 ... 150 ... 200* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 3A 00 00 hex	24E8h	0h

C.. Machine			
Par.	**Description**	**Fieldbus-address**	
C233 Global r=2, w=2	**Torque limit generating:** In contrast to absolute torque limitation, a maximum motor and generator torque can be specified with speed control. **C233** is read with the setting **C133** = *4:Parameter.* This parameter can be written in fieldbus mode. The current value of the signal *torque limit generating* can be viewed in **C333** regardless of the selected source. **NOTE** The motor and generator torque limitation is active when the display parameters **C332** and **C333** have a value other than zero. *Value range in %: 0 ... 150 ... 200* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 3A 40 00 hex	24E9h	0h
C330 Axis read (2)	**Torque limit:** Indication of the value of the *Torque Limit* signal on the interface for calculation of the torque limits. The internal, currently effective torque limits also depend on the fixed torque limits **C03** and **C05** as well as any possible torque limit due to the i²t model. The current limits are indicated in **E62** and **E66**. Fieldbus: 1LSB=1%; PDO ; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 52 80 00 hex	254Ah	0h
C331 Axis read (2)	**Torque limit 2:** The source of the signal *torque limit 2* is set in **C131**. When an absolute torque limit is used, *torque limit 2* is used as the second limit. When a binary signal (**D110**) is used, you can switch between the sources selected in **C130** and **C131** and a hard startup can be implemented. The current value of the signal *torque limit 2* can be viewed in **C331** regardless of the selected source. The torque limits which are currently in effect internally also depend on the fixed torque limits **C03** and **C05** as well as on a possible torque limit by the i²t model. The current limits are shown in **E62** and **E66**. Fieldbus: 1LSB=1%; PDO ; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 52 C0 00 hex	254Bh	0h
C332 Axis read (2)	**Torque limit motoring:** In contrast to absolute torque limitation, a maximum motor and generator torque can be specified when speed control is used. The current value of the signal *torque limit motoring* can be viewed in **C332** regardless of the sources selected in **C132**. **NOTE** The motor and generator torque limit is active when the display parameters **C332** and **C333** contain a value other than zero. Fieldbus: 1LSB=1%; PDO ; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 53 00 00 hex	254Ch	0h
C333 Axis read (2)	**Torque limit generating:** In contrast to absolute torque limitation, a maximum motor and generator torque can be specified when speed control is used. The current value of the signal *torque limit generating* can be viewed in **C333** regardless of the sources selected in **C133**. **NOTE** The motor and generator torque limit is active when the display parameters **C332** and **C333** contain a value other than zero. Fieldbus: 1LSB=1%; PDO ; Type: I16; (raw value:32767·LSB=200%); USS-Adr: 03 53 40 00 hex	254Dh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D00 Axis, OFF r=2, w=2	**Acceleration ramp:** Acceleration ramp of the speed ramp generator. *Value range in ms/3000rpm: 1 ... <u>100</u> ... 49152000* Fieldbus: 1LSB=1ms/3000rpm; Type: I32; raw value:1LSB=Fnct.no.10; USS-Adr: 04 00 00 00 hex	2600h	0h
D01 Axis, OFF r=2, w=2	**Deceleration ramp:** Deceleration ramp of the speed ramp generator. *Value range in ms/3000rpm: 1 ... <u>100</u> ... 49152000* Fieldbus: 1LSB=1ms/3000rpm; Type: I32; raw value:1LSB=Fnct.no.10; USS-Adr: 04 00 40 00 hex	2601h	0h
D10.0 Axis r=0, w=2	**Preset name:** Parameters **D10**.X, **D11**.X and **D12**.X define a preset reference value. A plain text description of the preset reference value can be entered in **D10**.X. *Default setting: Name 00* Fieldbus: Type: Str16; USS-Adr: 04 02 80 00 hex	260Ah Array	0h
D10.1 Axis r=0, w=2	**Preset name** *Default setting: Name 01* Fieldbus: Type: Str16; USS-Adr: 04 02 80 01 hex	260Ah Array	1h
D10.2 Axis r=0, w=2	**Preset name** *Default setting: Name 02* Fieldbus: Type: Str16; USS-Adr: 04 02 80 02 hex	260Ah Array	2h
D10.3 Axis r=0, w=2	**Preset name** *Default setting: Name 03* Fieldbus: Type: Str16; USS-Adr: 04 02 80 03 hex	260Ah Array	3h
D10.4 Axis r=0, w=2	**Preset name** *Default setting: Name 04* Fieldbus: Type: Str16; USS-Adr: 04 02 80 04 hex	260Ah Array	4h
D10.5 Axis r=0, w=2	**Preset name** *Default setting: Name 05* Fieldbus: Type: Str16; USS-Adr: 04 02 80 05 hex	260Ah Array	5h
D10.6 Axis r=0, w=2	**Preset name** *Default setting: Name 06* Fieldbus: Type: Str16; USS-Adr: 04 02 80 06 hex	260Ah Array	6h
D10.7 Axis r=0, w=2	**Preset name** *Default setting: Name 07* Fieldbus: Type: Str16; USS-Adr: 04 02 80 07 hex	260Ah Array	7h
D10.8 Axis r=0, w=2	**Preset name** *Default setting: Name 08* Fieldbus: Type: Str16; USS-Adr: 04 02 80 08 hex	260Ah Array	8h
D10.9 Axis r=0, w=2	**Preset name** *Default setting: Name 09* Fieldbus: Type: Str16; USS-Adr: 04 02 80 09 hex	260Ah Array	9h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D10.10 Axis r=0, w=2	**Preset name** *Default setting: Name 10* Fieldbus: Type: Str16; USS-Adr: 04 02 80 0A hex	260Ah Array	000 Ah
D10.11 Axis r=0, w=2	**Preset name** *Default setting: Name 11* Fieldbus: Type: Str16; USS-Adr: 04 02 80 0B hex	260Ah Array	000 Bh
D10.12 Axis r=0, w=2	**Preset name** *Default setting: Name 12* Fieldbus: Type: Str16; USS-Adr: 04 02 80 0C hex	260Ah Array	000 Ch
D10.13 Axis r=0, w=2	**Preset name** *Default setting: Name 13* Fieldbus: Type: Str16; USS-Adr: 04 02 80 0D hex	260Ah Array	000 Dh
D10.14 Axis r=0, w=2	**Preset name** *Default setting: Name 14* Fieldbus: Type: Str16; USS-Adr: 04 02 80 0E hex	260Ah Array	000 Eh
D10.15 Axis r=0, w=2	**Preset name** *Default setting: Name 15* Fieldbus: Type: Str16; USS-Adr: 04 02 80 0F hex	260Ah Array	000 Fh
D11.0 Axis r=1, w=2	**Preset reference:** Parameters **D10**.X, **D11**.X and **D12**.X define a preset reference value. The value of the preset reference value (e.g., 1500 rpm) is entered in **D11**.X. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 00 hex	260Bh Array	0h
D11.1 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 200 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 01 hex	260Bh Array	1h
D11.2 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 400 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 02 hex	260Bh Array	2h
D11.3 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 600 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 03 hex	260Bh Array	3h
D11.4 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 800 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 04 hex	260Bh Array	4h
D11.5 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 1000 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 05 hex	260Bh Array	5h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D11.6 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 1200 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 06 hex	260Bh Array	6h
D11.7 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 1400 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 07 hex	260Bh Array	7h
D11.8 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 1600 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 08 hex	260Bh Array	8h
D11.9 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 1800 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 09 hex	260Bh Array	9h
D11.10 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 2000 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 0A hex	260Bh Array	000 Ah
D11.11 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 2200 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 0B hex	260Bh Array	000 Bh
D11.12 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 2400 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 0C hex	260Bh Array	000 Ch
D11.13 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 2600 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 0D hex	260Bh Array	000 Dh
D11.14 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 2800 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 0E hex	260Bh Array	000 Eh
D11.15 Axis r=1, w=2	**Preset reference** *Value range in D89: -17 Bit ... 3000 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 02 C0 0F hex	260Bh Array	000 Fh
D12.0 Axis r=1, w=2	**Preset ramp:** Parameters **D10**.X, **D11**.X and **D12**.X define a preset reference value. A preset reference value is linked to a ramp profile in **D12.X**. This setting does not take effect unless **D13** = *1:Ramp profile* is parameterized. *Value range: 0 ... 0 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 00 hex	260Ch Array	0h
D12.1 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 1 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 01 hex	260Ch Array	1h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D12.2 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 2 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 02 hex	260Ch Array	2h
D12.3 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 3 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 03 hex	260Ch Array	3h
D12.4 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 4 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 04 hex	260Ch Array	4h
D12.5 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 5 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 05 hex	260Ch Array	5h
D12.6 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 6 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 06 hex	260Ch Array	6h
D12.7 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 7 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 07 hex	260Ch Array	7h
D12.8 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 8 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 08 hex	260Ch Array	8h
D12.9 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 9 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 09 hex	260Ch Array	9h
D12.10 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 10 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 0A hex	260Ch Array	000 Ah
D12.11 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 11 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 0B hex	260Ch Array	000 Bh
D12.12 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 12 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 0C hex	260Ch Array	000 Ch
D12.13 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 13 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 0D hex	260Ch Array	000 Dh
D12.14 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 14 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 0E hex	260Ch Array	000 Eh

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D12.15 Axis r=1, w=2	**Preset ramp** *Value range: 0 ... 15 ... 15* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 00 0F hex	260Ch Array	000 Fh
D13 Axis r=1, w=2	**Preset ramp select:** Parameter **D13** defines the link between preset reference value and ramp profile. A choice of three methods is available. When the setting is *0:preset* value, the link is implemented with the array element (example: the preset reference value **D11**.2 is coupled with the ramp profiles **D20**.2 to **D25**.2). When the setting is *1:Ramp profile*, the setting of parameter **D12**.X is valid (example: when **D12**.4 = 7, preset reference value 4 and ramp profile 7 are used with parameters **D20**.7 to **D25**.7). Several preset reference values can be combined with a ramp profile with this setting. This minimizes configuration time. When the setting *2:binary signals* is used, binary-coded acceleration and deceleration ramps are assigned to a preset reference value. Assignment is made separately for deceleration and acceleration ramps. The sources for binary signals are set in **D126**.X for the acceleration ramps and in **D127**.X for the deceleration ramps. *0: preset value;* *1: ramp profil;* *2: binary signals;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 03 40 00 hex	260Dh	0h
D20.0 Axis r=0, w=2	**Preset ramp name:** A ramp name is defined by parameters **D20**.X to **D25**.X. A plain text designation is entered for the ramp name in **D20**.X. *Default setting: Ramp 00* Fieldbus: Type: Str16; USS-Adr: 04 05 00 00 hex	2614h Array	0h
D20.1 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 01* Fieldbus: Type: Str16; USS-Adr: 04 05 00 01 hex	2614h Array	1h
D20.2 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 02* Fieldbus: Type: Str16; USS-Adr: 04 05 00 02 hex	2614h Array	2h
D20.3 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 03* Fieldbus: Type: Str16; USS-Adr: 04 05 00 03 hex	2614h Array	3h
D20.4 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 04* Fieldbus: Type: Str16; USS-Adr: 04 05 00 04 hex	2614h Array	4h
D20.5 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 05* Fieldbus: Type: Str16; USS-Adr: 04 05 00 05 hex	2614h Array	5h
D20.6 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 06* Fieldbus: Type: Str16; USS-Adr: 04 05 00 06 hex	2614h Array	6h
D20.7 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 07* Fieldbus: Type: Str16; USS-Adr: 04 05 00 07 hex	2614h Array	7h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D20.8 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 08* Fieldbus: Type: Str16; USS-Adr: 04 05 00 08 hex	2614h Array	8h
D20.9 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 09* Fieldbus: Type: Str16; USS-Adr: 04 05 00 09 hex	2614h Array	9h
D20.10 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 10* Fieldbus: Type: Str16; USS-Adr: 04 05 00 0A hex	2614h Array	000 Ah
D20.11 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 11* Fieldbus: Type: Str16; USS-Adr: 04 05 00 0B hex	2614h Array	000 Bh
D20.12 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 12* Fieldbus: Type: Str16; USS-Adr: 04 05 00 0C hex	2614h Array	000 Ch
D20.13 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 13* Fieldbus: Type: Str16; USS-Adr: 04 05 00 0D hex	2614h Array	000 Dh
D20.14 Axis r=0, w=2	**Preset ramp name** *Default setting: Ramp 14* Fieldbus: Type: Str16; USS-Adr: 04 05 00 0E hex	2614h Array	000 Eh
D20.15 Axis r=0, w=2	**preset ramp name** *Default setting: Ramp 15* Fieldbus: Type: Str16; USS-Adr: 04 05 00 0F hex	2614h Array	000 Fh
D21.0 Axis r=1, w=2	**Preset ramp symmetric:** A ramp profile is defined by parameters **D20**.X to **D25**.X. **D21**.X determines whether the same ramps apply to clockwise and counterclockwise. When the setting *0:inactive* is used, **D22**.X and **D23**.X are used for clockwise and **D24**.X and **D25**.X for counterclockwise. When **D21**.X is set to*1:active*, **D22**.X and **D23**.X are used independently of the direction of rotation. *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 00 hex	2615h Array	0h
D21.1 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 01 hex	2615h Array	1h
D21.2 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 02 hex	2615h Array	2h
D21.3 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 03 hex	2615h Array	3h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D21.4 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 04 hex	2615h Array	4h
D21.5 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 05 hex	2615h Array	5h
D21.6 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 06 hex	2615h Array	6h
D21.7 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 07 hex	2615h Array	7h
D21.8 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 08 hex	2615h Array	8h
D21.9 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 09 hex	2615h Array	9h
D21.10 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 0A hex	2615h Array	000 Ah
D21.11 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 0B hex	2615h Array	000 Bh
D21.12 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 0C hex	2615h Array	000 Ch
D21.13 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 0D hex	2615h Array	000 Dh
D21.14 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 0E hex	2615h Array	000 Eh
D21.15 Axis r=1, w=2	**Preset ramp symmetric** *Value range: 0 ... 0: inactive ... 1* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 05 40 0F hex	2615h Array	000 Fh

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D22.0 Axis r=1, w=2	**Preset accel right:** A ramp profile is defined by parameters **D20**.X to **D25**.X. The acceleration ramp for clockwise or positive reference value is entered in **D22**.X. When **D21**.X is set to *1:active*, **D22**.X is used for clockwise and counterclockwise. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 00 hex	2616h Array	0h
D22.1 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 01 hex	2616h Array	1h
D22.2 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 02 hex	2616h Array	2h
D22.3 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 03 hex	2616h Array	3h
D22.4 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 04 hex	2616h Array	4h
D22.5 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 05 hex	2616h Array	5h
D22.6 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 06 hex	2616h Array	6h
D22.7 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 07 hex	2616h Array	7h
D22.8 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 08 hex	2616h Array	8h
D22.9 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 09 hex	2616h Array	9h
D22.10 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 0A hex	2616h Array	000 Ah
D22.11 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 0B hex	2616h Array	000 Bh

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D22.12 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 0C hex	2616h Array	000 Ch
D22.13 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 0D hex	2616h Array	000 Dh
D22.14 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 0E hex	2616h Array	000 Eh
D22.15 Axis r=1, w=2	**Preset accel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 80 0F hex	2616h Array	000 Fh
D23.0 Axis r=1, w=2	**Preset decel right:** A ramp profile is defined by parameters **D20**.X to **D25**.X. The deceleration ramp for clockwise or positive reference value is entered in **D23**.X. When **D21**.X is set to *1:active*, **D23**.X is used for clockwise and counterclockwise. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 00 hex	2617h Array	0h
D23.1 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 01 hex	2617h Array	1h
D23.2 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 02 hex	2617h Array	2h
D23.3 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 03 hex	2617h Array	3h
D23.4 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 04 hex	2617h Array	4h
D23.5 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 05 hex	2617h Array	5h
D23.6 Axis r=1, w=2	**preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 06 hex	2617h Array	6h
D23.7 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 07 hex	2617h Array	7h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D23.8 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 08 hex	2617h Array	8h
D23.9 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 09 hex	2617h Array	9h
D23.10 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 0A hex	2617h Array	000 Ah
D23.11 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 0B hex	2617h Array	000 Bh
D23.12 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 0C hex	2617h Array	000 Ch
D23.13 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 0D hex	2617h Array	000 Dh
D23.14 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 0E hex	2617h Array	000 Eh
D23.15 Axis r=1, w=2	**Preset decel right** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 05 C0 0F hex	2617h Array	000 Fh
D24.0 Axis r=1, w=2	**Preset accel left:** A ramp profile is defined by parameters **D20**.X to **D25**.X. The acceleration ramp for counterclockwise or negative reference value is entered in **D24**.X. When **D21**.X is set to *1:active*, **D24**.X is not used. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 00 hex	2618h Array	0h
D24.1 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 01 hex	2618h Array	1h
D24.2 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 02 hex	2618h Array	2h
D24.3 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 03 hex	2618h Array	3h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D24.4 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 04 hex	2618h Array	4h
D24.5 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 05 hex	2618h Array	5h
D24.6 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 06 hex	2618h Array	6h
D24.7 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 07 hex	2618h Array	7h
D24.8 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 08 hex	2618h Array	8h
D24.9 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 09 hex	2618h Array	9h
D24.10 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 0A hex	2618h Array	000 Ah
D24.11 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 0B hex	2618h Array	000 Bh
D24.12 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 0C hex	2618h Array	000 Ch
D24.13 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 0D hex	2618h Array	000 Dh
D24.14 Axis r=1, w=2	**Preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 0E hex	2618h Array	000 Eh
D24.15 Axis r=1, w=2	**preset accel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 00 0F hex	2618h Array	000 Fh

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D25.0 Axis r=1, w=2	**Preset decel left:** A ramp profile is defined by parameters **D20**.X to **D25**.X. The deceleration ramp for counterclockwise or negative reference value is entered in **D25**.X. When **D21**.X is set to *1:active*, **D25**.X is not used. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 00 hex	2619h Array	0h
D25.1 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 01 hex	2619h Array	1h
D25.2 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 02 hex	2619h Array	2h
D25.3 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 03 hex	2619h Array	3h
D25.4 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 04 hex	2619h Array	4h
D25.5 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 05 hex	2619h Array	5h
D25.6 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 06 hex	2619h Array	6h
D25.7 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 07 hex	2619h Array	7h
D25.8 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 08 hex	2619h Array	8h
D25.9 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 09 hex	2619h Array	9h
D25.10 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 0A hex	2619h Array	000 Ah
D25.11 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 0B hex	2619h Array	000 Bh

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D25.12 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 0C hex	2619h Array	000 Ch
D25.13 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 0D hex	2619h Array	000 Dh
D25.14 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 0E hex	2619h Array	000 Eh
D25.15 Axis r=1, w=2	**Preset decel left** *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 06 40 0F hex	2619h Array	000 Fh
D26.0 Axis r=0, w=2	**Fix value name:** A fixed value is defined by parameters **D26**.X and **D27**.X. The plain text description of the fixed value is entered in **D26**.X. Fixed values can only be used as adding and multiplying reference values (**D31** or **D33**). *Default setting: Name 00* Fieldbus: Type: Str16; USS-Adr: 04 06 80 00 hex	261Ah Array	0h
D26.1 Axis r=0, w=2	**Fix value name** *Default setting: Name 01* Fieldbus: Type: Str16; USS-Adr: 04 06 80 01 hex	261Ah Array	1h
D26.2 Axis r=0, w=2	**Fix value name** *Default setting: Name 02* Fieldbus: Type: Str16; USS-Adr: 04 06 80 02 hex	261Ah Array	2h
D26.3 Axis r=0, w=2	**Fix value name** *Default setting: Name 03* Fieldbus: Type: Str16; USS-Adr: 04 06 80 03 hex	261Ah Array	3h
D26.4 Axis r=0, w=2	**Fix value name** *Default setting: Name 04* Fieldbus: Type: Str16; USS-Adr: 04 06 80 04 hex	261Ah Array	4h
D26.5 Axis r=0, w=2	**Fix value name** *Default setting: Name 05* Fieldbus: Type: Str16; USS-Adr: 04 06 80 05 hex	261Ah Array	5h
D26.6 Axis r=0, w=2	**Fix value name** *Default setting: Name 06* Fieldbus: Type: Str16; USS-Adr: 04 06 80 06 hex	261Ah Array	6h
D26.7 Axis r=0, w=2	**Fix value name** *Default setting: Name 07* Fieldbus: Type: Str16; USS-Adr: 04 06 80 07 hex	261Ah Array	7h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D27.0 Axis r=1, w=2	**Fix value:** A fixed value is defined by **D26**.X and **D27**.X. The value of the fixed value (e.g., 1500 rpm) is entered in **D27**.X. Fixed values can only be used as adding and multiplying reference values (**D31** or **D33**). When they are used for percental adding (**D32** = 1: percentage of **D56**) or multiplying, they refer to the parameter **D56**. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 00 hex	261Bh Array	0h
D27.1 Axis r=1, w=2	**Fix value** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 01 hex	261Bh Array	1h
D27.2 Axis r=1, w=2	**Fix value** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 02 hex	261Bh Array	2h
D27.3 Axis r=1, w=2	**Fix value** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 03 hex	261Bh Array	3h
D27.4 Axis r=1, w=2	**Fix value** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 04 hex	261Bh Array	4h
D27.5 Axis r=1, w=2	**Fix value** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 05 hex	261Bh Array	5h
D27.6 Axis r=1, w=2	**Fix value** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 06 hex	261Bh Array	6h
D27.7 Axis r=1, w=2	**Fix value** *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 06 C0 07 hex	261Bh Array	7h
D28 Axis r=1, w=2	**Jog ramp: D28** specifies the ramp of the jog reference value. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 500 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 07 00 00 hex	261Ch	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D30 Axis r=2, w=2	**Main ref value source:** The main reference value is set in **D30**. The following functions are available: *ref value external*, *correct ref1* and *correct ref2*, *preset values*, *motorized pot*, *PID control error* and *n-actual*. Selection can also be made via the binary signals *main ref value 0* to *2*. The *main ref value select* signals take precedence over the setting in **D30**. The arrangement of the functions in the **D30** selection lets you switch between two functions with a binary signal (e.g., *ref value external > preset value* with **D118.0** *main ref value 0*, or *ref value external > correct ref2* with **D118**.2 *main ref value 2*). *0: Ref value external;* *1: preset value;* *2: correct ref1;* *3: motorised pot;* *4: correct ref2;* *5: PID;* *6: n-actual;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 07 80 00 hex	261Eh	0h
D31 Axis r=2, w=2	**Additional ref value source:** An addition reference value is selected in **D31**. The additional reference value is activated by changing the default setting *0:inactive* to one of the reference value functions. The following functions are available: *ref value external*, *correct ref1* and *correct ref2*, *preset value* and *fixed value*, *motorized pot* and *PID control error*. The additional reference value can have an absolute or percental effect (in reference to **D56**) on the main reference value. *0: inactive;* *1: Ref value external;* *2: preset value;* *3: correct ref1;* *4: motorised pot;* *5: correct ref2;* *6: PID;* *7: fix value;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 07 C0 00 hex	261Fh	0h
D32 Axis r=2, w=2	**Mode additional ref value:** **D32** determines whether the additional reference value (AS) is added as an absolute value or as a percental value to the main reference value (HSW). When the setting is *0:absolute,* the calculation HSW + AS is used. When the selection *1:percentage* is used, the additional reference value refers to **D56** and is weighted with the main reference value. The total calculation is: HSW + HSW x AS / **D56** *0: absolute;* *1: percental of D56;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 08 00 00 hex	2620h	0h
D33 Axis r=2, w=2	**Factor ref value source:** The multiplying reference value is selected in **D33**. The multiplying reference value (MSW) is used to weight the main reference value (HSW) or the result of the addition of main reference value and additional reference value (HSW + ASW). The following functions are available for the multiplying reference value: *ref value external*, *correct ref1* and *correct ref2*, *preset value* and *fixed value*, *motorized pot* and *PID control error.* For weighting, the multiplying reference value (MSW) is based on **D56** and is then multiplied by the main reference value (HSW) or main reference value + additional reference value (HSW + ASW): HSW x MSW / **D56** or (HSW + ASW) x MSW / **D56** *0: inactive;* *1: Ref value external;* *2: preset value;* *3: correct ref1;* *4: motorised pot;* *5: correct ref2;* *6: PID;* *7: fix value;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 08 40 00 hex	2621h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D34 Axis r=2, w=2	**PID ref value source: D34** specifies the source for the PID reference value. The source can be an analog signal, preset reference values or motorized pot value. When the setting is *0:analog signals,* **G132** defines whether the signal is to be supplied via an analog input or via fieldbus. **NOTE** The PID controller is enabled if it was activated as the reference value *PID* in **D30**, **D31** or **D33**. *0: Reference value external;* *1: preset value;* *2: motorised pot;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 08 80 00 hex	2622h	0h
D35 Axis r=2, w=2	**Mode limit switch:** The comfort reference value application permits the positioning range to be limited by limit switches. When one of the limit switches triggers, deceleration is performed with the stop or quick stop ramp. The selection is made in **D35**. When the setting is *0:quickstop ramp,* **D85** is used. When *1:stop ramp* is parameterized, **D84** takes effect if the value of **D84** is not zero. If this is not the case, **D85** quick stop ramp is also used for this setting. The sources of the limit switch signals are specified in **D103** and **D104**. *0: quickstop ramp;* *1: stop ramp;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 08 C0 00 hex	2623h	0h
D40 Axis r=2, w=2	**Motorised pot preset mode:** The motorized pot reference value can be set to the value in **D44** by using one or more conditions. A binary signal whose source can be selected in **D116** is available for this. The following choices can also be activated in the bit pattern **D40**: Bit 0 - For power on: Bit is set for power on. Bit 1 - For stop: Bit is set when a stop signal is active (selector **D102**, indication **D302**). Bit 2 - For enable off: Bit is set when the enable is turned off. Bit 3 - For malfunction: Bit is set when a malfunction occurs. Bit 4 - For quick stop: Bit is set when a quick stop is triggered. When several bits are selected and the binary signal in **D116**, the selections are OR-linked. This means that only one of the conditions must be fulfilled for the setting of the bit. Bit 5 is used to set whether the applicable key (UP or DOWN) is disabled in the "speed control" operating mode when the torque limits E180 or E181 are reached. When the bit is inactive, the keys are not disabled. Bit 6 is used to set whether evaluation of the reset conditions is to be edge or level-triggered. When the bit is inactive, evaluation is edge-triggered. When the bit is active, the signal level is evaluated. Bit 7 is used to set the ramps. When the bit is inactive, **D41** is used as the acceleration ramp and **D42** is used as the deceleration ramp. When bit 7 is activated, **D41** and **D42** are used for acceleration and deceleration. A binary signal (setting of the signal source in **D117**) is used to switch between **D41** and **D42**. This makes it possible to approach the motorized pot reference value area with a fast ramp. After the switch to the second (lower) ramp, the motorized pot reference value can be adjusted for more sensitivity. *Value range: 0 ... 00000000bin ... 255 (Representation binary)* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 0A 00 00 hex	2628h	0h
D41 Axis r=1, w=2	**Motorised pot ramp 1:** The ramps of the motorized pot reference value can be used in two ways, depending on parameter **D40** bit7: • When the bit is *0:inactive*, **D41** is used as the acceleration ramp and **D42** is used as the deceleration ramp • When the bit is activated, **D41** and **D42** are used for acceleration and deceleration. A binary signal (setting of the signal source in **D117**) is used to switch between **D41** and **D42**. This makes it possible to approach the motorized pot reference value area with a fast ramp. After the switch to the second (lower) ramp, the motorized pot reference value can be adjusted for more sensitivity. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 100 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 0A 40 00 hex	2629h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D42 Axis r=1, w=2	**Motorised pot ramp 2:** The ramps of the motorized pot reference value can be used in two ways, depending on parameter **D40** bit7: • When the bit is *0:inactive*, **D41** is used as the acceleration ramp and **D42** is used as the deceleration ramp. • When the bit is activated, **D41** and **D42** are used for acceleration and deceleration. A binary signal (setting of the signal source in **D117**) is used to switch between **D41** and **D42**. This makes it possible to approach the motorized pot reference value area with a fast ramp. After the switch to the second (lower) ramp, the motorized pot reference value can be adjusted for more sensitivity. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 100 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 0A 80 00 hex	262Ah	0h
D43 Axis r=1, w=2	**Motorised pot step value:** Parameter **D43** is used to set how the signals *"motorized pot UP"* and *"motorized pot DOWN"* are to affect the motorized pot reference signal. When the value 0 is entered, the reference value is changed with the ramps entered in **D41** and **D42**. This change is continuous as long as one of the signals *"motorized pot UP"* or *"motorized pot DOWN"* is active. When a value other than 0 is parameterized, the reference value is changed in steps. This step has the value entered in **D43**. The step is executed when a positive edge of the signal *"motorized pot UP"* or *"motorized pot DOWN"* occurs. A further edge is not evaluated until the current step is concluded. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0A C0 00 hex	262Bh	0h
D44 Axis r=1, w=2	**Motorised pot preset value:** The motorized pot reference value can be set to the value in **D44** depending on one or more conditions. Setting is executed as per the setting in **D40**. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... 0 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0B 00 00 hex	262Ch	0h
D45 Axis r=1, w=2	**Motorised pot upper limit:** When it reaches the value in **D45**, the motorized pot reference value is limited to this value unless an adding or multiplying reference value has been used before and the reference value limits were already reached. When the motorized pot reference value drops again, the change takes effect immediately. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... 3000 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0B 40 00 hex	262Dh	0h
D46 Axis r=1, w=2	**Motorised pot lower limit:** When it reaches the value in **D46**, the motorized pot reference value is limited to this value. When the motorized pot reference value increases again, the change takes effect immediately. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -17 Bit ... -3000 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0B 80 00 hex	262Eh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D51.0 Axis r=1, w=2	**Minimum ref value:** The functions *ref value external*, *correct ref1* and *correct ref2*, *jog ref value*, *PID ref value* and *PID actual value* can be accessed via fieldbus or as analog signals (interface AE1, AE2, AE3). The reference values are scaled with the parameters **D51**.X to **D54**.X. Parameter **D51**.X specifies up to what reference value the minimum speed **D53**.X is to be held. The following applies to the parameter elements: **D51**.0 = Minimum reference value *ref value external* **D51**.1 = Minimum reference value *correct ref1* **D51**.2 = Minimum reference value *correct ref2* **D51**.3 = Minimum reference value *jog ref value* **D51**.4 = Minimum reference value *PID ref value* **D51**.5 = Minimum reference value *PID actual value* *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0C C0 00 hex	2633h Array	0h
D51.1 Axis r=1, w=2	**Minimum ref value** *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0C C0 01 hex	2633h Array	1h
D51.2 Axis r=1, w=2	**Minimum ref value** *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0C C0 02 hex	2633h Array	2h
D51.3 Axis r=1, w=2	**Minimum ref value** *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0C C0 03 hex	2633h Array	3h
D51.4 Axis r=1, w=2	**Minimum ref value** *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0C C0 04 hex	2633h Array	4h
D51.5 Axis r=1, w=2	**Minimum ref value** *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0C C0 05 hex	2633h Array	5h
D52.0 Axis r=1, w=2	**Maximum ref value:** The functions *ref value external*, *correct ref1* and *correct ref2*, *jog ref value*, *PID ref value* and *PID actual value* can be accessed via fieldbus or as analog signals (interface AE1, AE2, AE3). The reference values are scaled with the parameters **D51**.X to **D54**.X. Parameter **D52**.X specifies up to what reference value the maximum speed **D54**.X is to be held. The following applies to the parameter elements: **D52**.0 = Maximum reference value *ref value external* **D52**.1 = Maximum reference value *correct ref1* **D52**.2 = Maximum reference value *correct ref2* **D52**.3 = Maximum reference value *jog ref value* **D52**.4 = Maximum reference value *PID ref value* **D52**.5 = Maximum reference value *PID actual value* *Value range in %: -200.0 ... 100,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0D 00 00 hex	2634h Array	0h
D52.1 Axis r=1, w=2	**Maximum ref value** *Value range in %: -200.0 ... 100,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0D 00 01 hex	2634h Array	1h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D52.2 Axis r=1, w=2	**Maximum ref value** *Value range in %: -200.0 ... <u>100,0</u> ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0D 00 02 hex	2634h Array	2h
D52.3 Axis r=1, w=2	**Maximum ref value** *Value range in %: -200.0 ... <u>100,0</u> ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0D 00 03 hex	2634h Array	3h
D52.4 Axis r=1, w=2	**Maximum ref value** *Value range in %: -200.0 ... <u>100,0</u> ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0D 00 04 hex	2634h Array	4h
D52.5 Axis r=1, w=2	**Maximum ref value** *Value range in %: -200.0 ... <u>100,0</u> ... 200.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 0D 00 05 hex	2634h Array	5h
D53.0 Axis r=1, w=2	**Minimum speed:** The functions *ref value external*, *correct ref1* and *correct ref2*, *jog ref value*, *PID ref value* and *PID actual value* can be accessed via fieldbus or as analog signals (interface AE1, AE2, AE3). The reference values are scaled with the parameters **D51**.X to **D54**.X. Parameter **D53**.X specifies the minimum speed. This speed is specified as long as the reference value signal is less than or equal to the value in **D51**.X. The following applies to the parameter elements: **D53**.0 = Minimum speed *ref value external* **D53**.1 = Minimum speed *correct ref1* **D53**.2 = Minimum speed *correct ref2* **D53**.3 = Minimum speed *jog ref value* **D53**.4 = Minimum speed *PID ref value* **D53**.5 = Minimum speed *PID actual value* **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D89: -8192 ... <u>0</u> ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 40 00 hex	2635h Array	0h
D53.1 Axis r=1, w=2	**Minimum speed** *Value range in D89: -8192 ... <u>0</u> ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 40 01 hex	2635h Array	1h
D53.2 Axis r=1, w=2	**Minimum speed** *Value range in D89: -8192 ... <u>0</u> ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 40 02 hex	2635h Array	2h
D53.3 Axis r=1, w=2	**Minimum speed** *Value range in D89: -8192 ... <u>0</u> ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 40 03 hex	2635h Array	3h
D53.4 Axis r=1, w=2	**Minimum speed** *Value range in D89: -8192 ... <u>0</u> ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 40 04 hex	2635h Array	4h
D53.5 Axis r=1, w=2	**Minimum speed** *Value range in D89: -8192 ... <u>0</u> ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 40 05 hex	2635h Array	5h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D54.0 Axis r=1, w=2	**Maximum speed:** The functions *ref value external*, *correct ref1* and *correct ref2*, *jog ref value*, *PID ref value* and *PID actual value* can be accessed via fieldbus or as analog signals (interface AE1, AE2, AE3). The reference values are scaled with the parameters **D51**.X to **D54**.X. Parameter **D54**.X specifies the maximum speed which can be specified by the particular function. This speed is reached when the reference value is equal to or greater than the value in **D52**.X. The following applies to the parameter elements: **D54**.0 = Minimum speed *ref value external* **D54**.1 = Minimum speed *correct ref1* **D54**.2 = Minimum speed *correct ref2* **D54**.3 = Minimum speed *jog ref value* **D54**.4 = Minimum speed *PID ref value* **D54**.5 = Minimum speed *PID actual value* **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D89: -8192 ... 3000 ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 80 00 hex	2636h Array	0h
D54.1 Axis r=1, w=2	**Maximum speed** *Value range in D89: -8192 ... 3000 ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 80 01 hex	2636h Array	1h
D54.2 Axis r=1, w=2	**Maximum speed** *Value range in D89: -8192 ... 3000 ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 80 02 hex	2636h Array	2h
D54.3 Axis r=1, w=2	**Maximum speed** *Value range in D89: -8192 ... 3000 ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 80 03 hex	2636h Array	3h
D54.4 Axis r=1, w=2	**Maximum speed** *Value range in D89: -8192 ... 3000 ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 80 04 hex	2636h Array	4h
D54.5 Axis r=1, w=2	**Maximum speed** *Value range in D89: -8192 ... 3000 ... 8192* Fieldbus: 1LSB=siehe D86; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0D 80 05 hex	2636h Array	5h
D55 Axis r=2, w=2	**Ref. val. enable control word:** The reference value functions *ref value external*, *correct ref1* and *correct ref2*, *jog ref value*, *PID ref value* and *PID actual value* generate a reference value enable. The evaluation of the reference value enable is activated in **D55**. The reference value enable which is to be used is set here with the bits. Bit0: Reference value external Bit1: Correction reference value 1 Bit2: Correction reference value 2 Bit3: Jog reference value Bit4: PID reference value Bit5: PID actual value The enable of a reference value is active when the particular bit in **D55** is active and the reference value has reached the value in the applicable parameter **D51**.X. The reference value enable is AND-linked with the *additional enable 2* signal (selector **D113**, display **D313**). If both signals are active, the device can be enabled together with the hardware enable on X1. Several reference value enables can be used at the same time. In this case, at least one of the reference value enables must be active. *Value range: 0 ... 00000000bin ... 255 (Representation binary)* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 0D C0 00 hex	2637h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D56 Axis r=1, w=2	**Rated unit speed:** Parameter **D56** is considered the value of reference for all percental reference values of the "comfort reference value" application. **NOTE** This parameter is indicated in user units. The user units are specified in **D87** and **D88**. *Value range in D89: 0 ... 3000 ... 17 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 0E 00 00 hex	2638h	0h
D57 Axis, OFF r=2, w=2	**Inverting motor direction:** The motor direction can be inverted with **D57**. This parameter can be used to view the reference value sign, regardless of the direction of the motor. An inversion with **D57** also changes the mounting position of the motor or the number of stages of a gearbox. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 0E 40 00 hex	2639h	0h
D60 Axis r=3, w=3	**Range control 1 source:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. The parameter to be controlled is entered in **D60**. **NOTE** Only parameters with the data format I16 can be controlled. If you want to control a speed value in the format I32, the format must first be changed with the parameters **D98**.X and **D99**.X. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 04 0F 00 00 hex	263Ch	0h
D61 Axis r=3, w=3	**Range control 1 factor:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. The parameter entered in **D60** can be weighted in **D61**. An entry of 25% corresponds to a factor of 1. *Value range in %: -800.0 ... 25,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 0F 40 00 hex	263Dh	0h
D62 Axis r=3, w=3	**Range control 1 low pass filter:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. The value of the parameter entered in **D60** is weighted with the factor **D61**. Low pass filtering takes place afterwards. **D62** specifies the filter time constants of the low pass. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 04 0F 80 00 hex	263Eh	0h
D63 Axis r=3, w=3	**Range control 1 mode:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. **D63** determines how the value entered in **D69** will be controlled. When **D63** is set to *0:range*, the limits are evaluated unchanged. When **D64** = -50% and **D67** = 60% are parameterized, the valid working range in this case is between -50% and 60%. Values under -50% or over +60% will cause the result 60 or 61. With*1:absolute* the limits specified in **D64** to **D67** are evaluated symmetrically to zero. When **D64** = 50% and **D67** = 60% are parameterized, the valid working range is between +50% to +60% or -60% and -50%. A value of the controlled parameter outside these ranges will cause the result 60 or 61. *0: range;* *1: absolute;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 0F C0 00 hex	263Fh	0h
D64 Axis r=3, w=3	**Range control 1 lower limit 2:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. **D64** determines the lower limit of range control. If **D69** drops below this limit, the display occurs in **D190** and event 60 is triggered. The level of the event can be set in **U100** to **U102**. *Value range in %: -800.0 ... -100,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 10 00 00 hex	2640h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D65 Axis r=3, w=3	**Range control 1 lower limit 1:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. **D65** determines the first lower limit of range control. **D191** indicates when this limit has been dropped below and signals that the value in **D69** is approaching the critical limit **D64**. When the value in **D69** is between **D65** and **D66**, this is indicated by **D192**. *Value range in %: -800.0 ... -50,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 10 40 00 hex	2641h	0h
D66 Axis r=3, w=3	**Range control 1 upper limit 1:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. **D66** determines the first upper limit of range control. **D193** indicates when this limit has been dropped above and signals that the value in **D69** is approaching the critical limit **D67**. When the value in **D69** is between **D65** and **D66**, this is indicated by **D192**. *Value range in %: -800.0 ... 50,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 10 80 00 hex	2642h	0h
D67 Axis r=3, w=3	**Range control 1 upper limit 2:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. **D67** determines the upper limit of range control. If **D69** drops above this limit, the display occurs in **D194** and event 61 is triggered. The level of the event can be set in **U110** to **U112**. *Value range in %: -800.0 ... 100,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 10 C0 00 hex	2643h	0h
D68 Axis r=3, w=3	**Range control 1 Accel + Enable:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. **D68** can be used to restrict range control to static operation. When *0:inactive* is parameterized, range control is not performed during acceleration procedures or when the enable is switched off. The result signals **D190** to **D194** are set to *0:inactive*. When **D68** is parameterized to *1:active*, range control is performed continuously and **D190** to **D194** are set accordingly. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 11 00 00 hex	2644h	0h
D69 Axis read (3)	**Range control 1 actual value:** Range control 1 is defined by parameters **D60** to **D69**. The result is indicated in **D190** to **D194**. **D69** indicates the value to be controlled after weighting with **D61** and low pass filtering with the time constant **D62**. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 11 40 00 hex	2645h	0h
D70 Axis r=3, w=3	**Range control 2 source:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. The parameter to be controlled is entered in **D70**. **NOTE** Only parameters with the data format I16 can be controlled. If you want to control a speed value in the format I32, the format must first be changed with the parameters **D98**.X and **D99**.X. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 04 11 80 00 hex	2646h	0h
D71 Axis r=3, w=3	**Range control 2 factor:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. The parameter entered in **D70** can be weighted in **D71**. An entry of 25% corresponds to a factor of 1. *Value range in %: -800.0 ... 25,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 11 C0 00 hex	2647h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D72 Axis r=3, w=3	**Range control 2 low pass filter:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. The value of the parameter entered in **D70** is weighted with the factor **D71**. Low pass filtering takes place afterwards. **D72** specifies the filter time constants of the low pass. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 04 12 00 00 hex	2648h	0h
D73 Axis r=3, w=3	**Range control 2 mode:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. **D73** determines how the value entered in **D79** will be controlled. When **D73** is set to *0:range*, the limits are evaluated unchanged. When **D74** = 50% and **D77** = 60% are parameterized, the valid working range in this case is between 50% and 60%. A value of -55% is invalid and triggers event 62. With*1:absolute* the limits specified in **D74** to **D77** are evaluated symmetrically to zero. When **D74** = 50% and **D77** = 60% are parameterized, the valid working range is between +50% to +60% or -60% and -50%. A value of the controlled parameter outside these ranges will cause the result 62 or 63. *0: range;* *1: absolute;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 12 40 00 hex	2649h	0h
D74 Axis r=3, w=3	**Range control 2 lower limit 2:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. **D74** determines the lower limit of range control. If **D79** drops below this limit, the display occurs in **D195** and event 62 is triggered. The level of the event can be set in **U120** to **U122**. *Value range in %: -800.0 ... -100,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 12 80 00 hex	264Ah	0h
D75 Axis r=3, w=3	**Range control 2 lower limit 1:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. **D75** determines the first lower limit of range control. **D196** indicates when this limit has been dropped below and signals that the value in **D79** is approaching the critical limit **D74**. When the value in **D79** is between **D75** and **D76**, this is indicated by **D197**. *Value range in %: -800.0 ... -50,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 12 C0 00 hex	264Bh	0h
D76 Axis r=3, w=3	**Range control 2 upper limit 1:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. **D76** determines the first lower limit of range control. **D198** indicates when this limit has been dropped above and signals that the value in **D79** is approaching the critical limit **D77**. When the value in **D79** is between **D75** and **D76**, this is indicated by **D197**. *Value range in %: -800.0 ... 50,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 13 00 00 hex	264Ch	0h
D77 Axis r=3, w=3	**Range control 2 upper limit 2:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. **D77** determines the lower limit of range control. If **D79** drops above this limit, the display occurs in **D199** and event 63 is triggered. The level of the event can be set in **U130** to **U132**. *Value range in %: -800.0 ... 100,0 ... 800.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 13 40 00 hex	264Dh	0h
D78 Axis r=3, w=3	**Range control 2 Accel + Enable:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. **D78** can be used to restrict range control to static operation. When *0:inactive* is parameterized, range control is not performed during acceleration procedures or when the enable is switched off. The result signals **D195** to **D199** are set to *0:inactive*. When **D78** is parameterized to *1:active*, range control is performed continuously and **D195** to **D199** are set accordingly. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 13 80 00 hex	264Eh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D79 Axis read (3)	**Range control 2 actual value:** Range control 2 is defined by parameters **D70** to **D79**. The result is indicated in **D195** to **D199**. **D79** indicates the value to be controlled after weighting with **D71** and low pass filtering with the time constant **D72**. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 13 C0 00 hex	264Fh	0h
D80 Axis, OFF r=2, w=2	**Ramp smoothening:** An acceleration or braking procedure is extended during ramp smoothening by the time specified in **D80**. At the beginning of an acceleration or braking procedure, the ramp is linearly adjusted from 0 to the full value in the time **D80**. Near the end of the procedure, the ramp is adjusted during this time from the full value to 0 (trapezoid-shaped progression of the ramp). This corresponds to conventional jerk limitation. The speed has a parabola-shaped progression. With **D80**=0, quick stop (e.g., due to a malfunction) and during a load start, ramp smoothening is not active. The ramp which the ramp smoothening affects is dependent on the application selected (see list below). **NOTE** The ramp is only extended by **D80** when ramp smoothening, ramp and reference value change are adapted to each other in such a way that the maximum ramp value can be achieved (trapezoid-shaped progression of the ramp). In addition, all desired lengths of ramp smoothening times cannot be set. The maximum ramp smoothening time is first specified by the value range of **D80** (maximum of 10000 ms). For long ramps, this range is restricted to the value 49152000 / current ramp. *Application* — *Parameter* Fast reference value — **D00, D01** Technology controller — **D00, D01** Comfort reference value — Depending on the valid main reference value *Value range in ms: 0 ... 0 ... 10000* Fieldbus: 1LSB=1ms; Type: I32; USS-Adr: 04 14 00 00 hex	2650h	0h
D82 Axis r=1, w=2	**Accelerating ramp: D82** is the acceleration ramp for the reference value functions *ref value external*, *correct ref1* and *correct ref2*, and *PID control error.* The ramp is deactivated for the reference value functions *n-rmpg* (**D312** = 1:*active*) when the current speed corresponds to the master reference value *n-rmpg* +/- **C40/ 2** for the first time, and is activated when **D312** = *0: inactive*. **D82** is active when one of the reference value functions was selected as the main reference value in **D30**. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 14 80 00 hex	2652h	0h
D83 Axis r=1, w=2	**Decelerating ramp: D83** specifies the deceleration ramp for the reference value functions *ref value external*, *correct ref1* and *correst ref2*, and *PID error control.* The ramp is deactivated for the reference value functions *n-rmpg* (**D312** = 1:*active*) when the current speed corresponds to the master reference value *n-rmpg* +/- **C40/ 2** for the first time, and is activated when **D312** = 0: in*active*. **D83** is active when one of the reference value functions was selected as the main reference value in **D30**. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 14 C0 00 hex	2653h	0h
D84 Axis r=1, w=2	**Stop ramp: D84** determines the ramp when stop signal and limit switch signal are queued (in connection with **D35**). When **D84** contains the value 0, the drive stops with the quick stop ramp **D85**. When **D84** does not contain zero, the drive decelerates with the ramp **D84**. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 3000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 15 00 00 hex	2654h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D85 Axis, OFF r=1, w=2	**Quickstop ramp: D85** determines the ramp when quick stop signal and limit switch signal are queued (in connection with **D35**). **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. *Value range in D249: 0 ... 30000 ... 131072000* Fieldbus: 1LSB=siehe D86; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 15 40 00 hex	2655h	0h
D86 Axis r=2, w=3	**Decimal digits:** Parameters **D86** to **D89** specify the representation in user-defined units. The number of positions to be indicated after the decimal point is parameterized in **D86**. **NOTE** Since a change in **D86** causes the decimal point to shift (i.e., a change in the affected values), **D86** should be parameterized at the beginning of commissioning. **Example:** When **D86** is reduced from 2 to 1,a value such as *12.27 mm/s* changes to *122.7 mm/s*. *Value range: 0 ... 0 ... 3* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 15 80 00 hex	2656h	0h
D87 Axis, OFF r=2, w=3	**Numerator:** Parameters **D86** to **D89** specify the representation in user-defined units. **D87** and **D88** define the ratio of user units of the user to the speed of the motor in rpm. Since, in such cases, this ratio (reciprocal value of the total ratio) is rarely a whole number, it can be entered as a fraction. This prevents rounding errors. The numerator of this fraction is entered in **D87** and the denominator of this fraction is entered in **D88**. Example: A toothed belt drive has 41 measuring unit. Speeds are to be indicated in measuring units/minute. The toothed disk has 23 teeth. The belt has 917 teeth. The toothed belt is driven with the K302 0170 ED402 geared motor at a precise transmission ratio of 559/33. Solution: The motor revolves exactly 41 x 23/917 x 33/559 rpm per "measuring unit." The following are calculated from this: **D87** = 41 x 23 x 33 = 31119 **D88** = 559 x 917 = 512603 "Measuring unit" is entered in **D89**. **NOTE** Since a change in **D87** affects the values of other parameters, **D87** should be parameterized at the start of commissioning. *Value range in D89: 1 ... 1 ... 31 Bit* Fieldbus: 1LSB=siehe D86; Type: I32; (raw value:1LSB=1·<D89>); USS-Adr: 04 15 C0 00 hex	2657h	0h
D88 Axis, OFF r=2, w=3	**Denominator:** Parameters **D86** to **D89** specify the representation in user-defined units. **D87** and **D88** define the ratio of user units of the user to the speed of the motor in rpm. Since, in such cases, this ratio (reciprocal value of the total ratio) is rarely a whole number, it can be entered as a fraction. This prevents rounding errors. The numerator of this fraction is entered in **D87** and the denominator of this fraction is entered in **D88**. Example: A toothed belt drive has 41 measuring unit. Speeds are to be indicated in measuring units/minute. The toothed disk has 23 teeth. The belt has 917 teeth. The toothed belt is driven with the K302 0170 ED402 geared motor at a precise transmission ratio of 559/33. Solution: The motor revolves exactly 41 x 23/917 x 33/559 rpm per "measuring unit." The following are calculated from this: **D87** = 41 x 23 x 33 = 31119 **D88** = 559 x 917 = 512603 "Measuring unit" is entered in **D89**. **NOTE** Since a change in **D88** affects the values of other parameters, **D88** should be parameterized at the start of commissioning. *Value range: 1 ... 1 ... 31 Bit* Fieldbus: 1LSB=1; Type: I32; USS-Adr: 04 16 00 00 hex	2658h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D89 Axis r=2, w=3	**Measure.unit:** The parameters **D86** to **D89** specify the presentation in user-defined units. **D89** specifies the unit of measure of the user-defined speed (e.g., *bottles/s*, *degrees/s*, and so on). *Default setting: Upm* Fieldbus: Type: Str8; USS-Adr: 04 16 40 00 hex	2659h	0h
D90 Axis r=2, w=3	**Event value A: D90** can indicate the occurrence of a certain event. The number of the event is entered for this in **D90** (e.g., 41 (motor temperature sensor). When the value entered in **D90** equals the indication in **E82**, **D460** is set to *1:active*. **D460** can be accessed via a binary output. The signal in **D202** Bit 11 can be read out via fieldbus. *Value range: 0 ... 0 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 16 80 00 hex	265Ah	0h
D91 Axis r=2, w=3	**Event value B: D91** can indicate the occurrence of a certain event. The number of the event is entered for this in **D91** (e.g., 41 (motor temperature sensor). When the value entered in **D91** equals the indication in **E82**, **D461** is set to *1:active*. **D461** can be accessed via a binary output. The signal in **D202** Bit 12 can be read out via fieldbus. *Value range: 0 ... 0 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 16 C0 00 hex	265Bh	0h
D93 Global r=1, w=1	**Reference value generator:** For commissioning and optimization of speed control. If **D93**=*0:bipolar*, then +**D95** and -**D95** are specified alternately. If **D93**=*1:unipolar*, then 0 Rpm and **D95** are specified alternately. Each speed specification remains valid for the time **D94**. *0: bipolar;* Normal reference value selection. *1: unipolar;* ±**D95** is cyclically specified as reference value. The time can be set in **D94**. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 17 40 00 hex	265Dh	0h
D94 Global r=1, w=1	**Ref. val. generator time:** The reference value changes each time this period of time expires. *Value range in ms: -32768 ... 500 ... 32767* Fieldbus: 1LSB=1ms; Type: I16; USS-Adr: 04 17 80 00 hex	265Eh	0h
D95 Global r=1, w=1	**Ref. val. generator speed:** Speed reference value of the reference value generator. *Value range in rpm: -8191 ... 250 ... 8191* Fieldbus: 1LSB=1rpm; Type: I16; (raw value:32767 = 8191 rpm); USS-Adr: 04 17 C0 00 hex	265Fh	0h
D96.0 Global r=1, w=1	**Reference value generator & start:** Writing a one starts the *reference value generator* action. A square-shaped reference value is specified for the motor. The action can only be used with control modes s*ervo-control* and *vector control* (control mode **B20**). The enable must be LOW at the starting point. After **D96**.0=1, the enable must be switched HIGH. Any existing brake is automatically released. **WARNING** Starting the action releases the motor brake. Since, due to the action, the motor is not sufficiently energized, it is unable to carry any loads (e.g., in a lifting system). For this reason the action may only be performed with motors which are not installed in a system. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 18 00 00 hex	2660h	0h
D96.1 Global read (1)	**Process:** Shows the progress of the *reference value generator* action in %. Fieldbus: 1LSB=1%; Type: U8; USS-Adr: 04 18 00 01 hex	2660h	1h
D96.2 Global read (1)	**Result:** Shows the result of the *reference value generator* action. *0: error free;* *1: aborted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 18 00 02 hex	2660h	2h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D98.0 Axis r=3, w=3	**I32 scaled source:** Parameters **D98**.X and **D99**.X can be used to convert I32 values related to **D56** into I16 values. The I32 parameters are entered in **D98**.X. The value converted to I16 can be read in array **D99.X** in the same element. The scaling function makes it possible to use I32 values in range control and for output to analog outputs. Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 04 18 80 00 hex	2662h Array	0h
D98.1 Axis r=3, w=3	**I32 scaled source** Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 04 18 80 01 hex	2662h Array	1h
D98.2 Axis r=3, w=3	**I32 scaled source** Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 04 18 80 02 hex	2662h Array	2h
D98.3 Axis r=3, w=3	**I32 scaled source** Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 04 18 80 03 hex	2662h Array	3h
D99.0 Axis read (3)	**I16 scaled value:** Parameters **D98**.X and **D99**.X can be used to convert I32 values related to **D56** into I16 values. The I32 parameters are entered in **D98**.X. The value converted to I16 can be read in array **D99.X** in the same element. The scaling function makes it possible to use I32 values in range control and for output to analog outputs. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 18 C0 00 hex	2663h Array	0h
D99.1 Axis read (3)	**I16 scaled value** Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 18 C0 01 hex	2663h Array	1h
D99.2 Axis read (3)	**I16 scaled value** Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 18 C0 02 hex	2663h Array	2h
D99.3 Axis read (3)	**I16 scaled value** Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 18 C0 03 hex	2663h Array	3h
D100 Axis, OFF r=1, w=1	**Reverse source:** The *Reverse* (direction of revolution) signal reverses the direction of revolution of the motor. The parameter **D100** specifies the source for the *Reverse* signal. Possible selections *0:Low* and *1:High* are the same as fixed values. With **D100**=*3:BE1...28:BE13-inverse* , the *Reverse* signal can be executed via the selected binary input. With **D100**=*2:Parameter,* the control byte or the control word of the selected application is used as the signal source. This setting is provided for fieldbus operation. The control word can be assigned to various parameters in the different applications. The list below shows the control words for the different applications. The *Reverse* signal can be monitored in **D300** - regardless of the parameterized signal source. *Application* — *Parameter* — *Bit* Fast reference value — **D210** — **0** Technology controller — **G210** — **0** Comfort reference valuew — **D210** — **0** *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;*	2664h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	6: BE2-inverted; *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 19 00 00 hex		
D101 Axis, OFF r=1, w=1	**External fault source:** Selection of the source for the "*44:ext.Fault*" signal (external fault). With **D101**=*2:Parameter*, the control word is used as the signal source. This is designed for operation with a fieldbus system. The control word can be assigned to various parameters in the different applications. The list below shows the control words for the different applications. The signal can be directly monitored on the block input via **D301**. *Application* / *Parameter* / *Bit* Fast reference value / **D210** / **1** Technology controller / **G210** / **1** Comfort reference value / **D210** / **1** *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 19 40 00 hex	2665h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D102 Axis, OFF r=1, w=1	**Stop source:** When the *Stop* signal is active, the reference value 0 is specified for the drive. The motor stops. The parameter **D102** specifies the source of the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. Control word **D210** Bit2 is used as the source for selection *2:parameter*. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D302**. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in **D402**.0 and a "switch off" delay in **D402**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 19 80 00 hex	2666h	0h
D103 Axis, OFF r=1, w=1	**Limit switch+ source:** When the *end switch+* signal is active, application event 5 is triggered. The type of reaction and the text to be displayed can be specified in parameters **U150** to **U152**. The standard reaction is that the device assumes the "fault" state. The direction after the limit switch is passed over is blocked. After the fault is acknowledged, the drive can continue in the direction opposite from the switch. The parameter **D103** specifies the source of the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. Control word **D210** Bit3 is used as the source for selection *2:parameter*. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D303**. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in **D403**.0 and a "switch off" delay in **D403**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;*	2667h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	12: BE5-inverted; *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 19 C0 00 hex		
D104 Axis, OFF r=1, w=1	**Limit switch- source:** When the *end switch*- signal is active, application event 5 is triggered. The type of reaction and the text to be displayed can be specified in parameters **U150** to **U152**. The standard reaction is that the device assumes the "fault" state. The direction after the limit switch is passed over is blocked. After the fault is acknowledged, the drive can continue in the direction opposite from the switch. The parameter **D104** specifies the source of the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. Control word **D210** Bit4 is used as the source for selection *2:parameter*. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D304**. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in **D404**.0 and a "switch off" delay in **D404**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1A 00 00 hex	2668h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D105 Axis, OFF r=1, w=1	**Jog enable source:** When the drive reaches the standstill (motor speed is shown in window ±**C40**) when the *Stop* signal is active, jog mode can be enabled with *jog enable*. The parameter **D105** specifies the source for the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter*, the control word **D210** Bit5 is used as the source. The control word can be written via fieldbus. Regardless of the source selected, the signal is indicated in **D305**. If the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D405**.0 and a "switch off" delay in **D405**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1A 40 00 hex	2669h	0h
D106 Axis, OFF r=1, w=1	**Jog+ source:** When jog mode is enabled and the *Jog +* signal is active, the drive is accelerated with the jog ramp **D28** to the reference value selected in **D135**. The parameter **D106** specifies the source for the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D210** Bit6 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D306**. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;*	266Ah	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	18: BE8-inverted; *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1A 80 00 hex		
D107 Axis, OFF r=1, w=1	**Jog- source:** When jog mode is enabled and the *Jog* - signal is active, the drive is accelerated with the jog ramp **D28** to the negated reference value selected in **D135**. The parameter **D107** specifies the source of the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. Control word **D210** Bit7 is used as the source for selection *2:parameter*. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D307**. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1A C0 00 hex	266Bh	0h
D108 Axis, OFF r=1, w=1	**Positive blocking source:** When the signal *positive direction blocking* assumes the value *1:active,* no positive reference value is processed. When the direction is blocked during operation, the drive decelerates to a standstill with the respectively valid decelerating ramp. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D408**.0 and a "switch off" delay in **D408**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;*	266Ch	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	8: BE3-inverted; *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1B 00 00 hex		
D109 Axis, OFF r=1, w=1	**Negative blocking source:** When the signal *negative direction blocking* assumes the value *1:active,* no negative reference value is processed. When the direction is blocked during operation, the drive decelerates to a standstill with the respectively valid decelerating ramp. The parameter **D109** specifies the source for the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D210** Bit9 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D309**. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D409**.0 and a "switch off" delay in **D409**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1B 40 00 hex	266Dh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D110 Axis, OFF r=1, w=1	**Torque switch source:** The signal *torque switch* can be used to switch between the absolute torque limits *torque limit* and *torque limit 2*. *Torque limit* is active with a low level. *Torque limit 2* is used for a high level. The parameter **D110** specifies the source for the signal *torque switch*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D210** Bit10 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D310**. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D410**.0 and a "switch off" delay in **D410**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1B 80 00 hex	266Eh	0h
D111 Axis, OFF r=1, w=1	**Master / slave switch source:** When the signal *master / slave switch source* assumes the value *1:active,* the master reference value is processed (selector **D140**). The parameter **D111** specifies the source of the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. Control word **D210** Bit11 is used as the source for selection *2:parameter*. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D311**. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in **D411**.0 and a "switch off" delay in **D411**.1. **NOTE** When the master reference value is executed in torque control, the drive changes to speed mode when the signal is deactivated. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;*	266Fh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	10: BE4-inverted; *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1B C0 00 hex		
D112 Axis, OFF r=1, w=1	**Speed / torque switch source:** The signal *speed / torque switch* can be used to switch between speed and torque control when the drive is enabled. Speed control is active with a low level. Torque control is used for a high level. The parameter **D112** specifies the source of the signal *speed / torque switch*. The selections *0:low* and *1:high* correspond to fixed signal levels. Control word **D210** Bit12 is used as the source for selection *2:parameter*. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D312**. If the signal is to be processed with a time delay, a "switch on" delay can be parameterized in **D412**.0 and a "switch off" delay in **D412**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1C 00 00 hex	2670h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D113 Axis, OFF r=1, w=1	**Additional enable 2 source:** The signal *additional enable 2* is logically linked with the reference value enables. When these are activated (see **D55**), *additional enable 2,* a reference value enable and the device enable must assume the value *1:active* before the drive can be enabled. The parameter **D113** specifies the source for the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D210** Bit13 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D313**. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D413**.0 and a "switch off" delay in **D413**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1C 40 00 hex	2671h	0h
D114 Axis, OFF r=1, w=1	**Motorised pot up source:** A HIGH level of the signal *motorized pot UP* increases the motorized pot reference value as step or continuously, depending on **D43**. The parameter **D114** specifies the source for the signal *motorized pot UP*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D211** Bit0 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D314**. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;*	2672h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	15: BE7; *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1C 80 00 hex		
D115 Axis, OFF r=1, w=1	**Motorised pot down source:** A HIGH level of the signal *motorized pot DOWN* decreases the motorized pot reference value as step or continuously, depending on **D43**. The parameter **D115** specifies the source for the signal *motorized pot DOWN*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D211** Bit1 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D315**. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1C C0 00 hex	2673h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D116 Axis, OFF r=1, w=1	**Motorised pot preset source:** A HIGH level of the signal *motorized pot preset* resets the motorized pot reference value to the value entered in **D44** (edge or level-triggered depending on **D40** Bit6). The parameter **D116** specifies the source for the signal *motorized pot preset*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D211** Bit2 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D316**. If the signal is to be processed with time delay, a "switchon" delay can be parameterized in **D416**.0 and a "switchoff" delay in **D416**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1D 00 00 hex	2674h	0h
D117 Axis, OFF r=1, w=1	**Motorised pot ramp source:** When **D40** Bit7 is active, the signal *motorized pot ramp* can be used to switch between the ramps **D41** and **D42**. **D41** is used for a low level. The ramp **D42** is used for a high level. The parameter **D117** specifies the source for the signal *motorized pot ramp*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D211** Bit3 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D317**. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D417**.0 and a "switch off" delay in **D417**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;*	2675h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	13: BE6; *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1D 40 00 hex		
D118.0 Axis, OFF r=1, w=1	**Main ref value source:** The binary coded main-reference-value-select signals can be used during operation to choose between various main reference value sources (e.g., reference value, correction reference value or motor potentiometer). The selection with the main-reference-value-selectors takes precedence over the setting in **D30**. The parameters **D118**.0 to **D118**.2 specify the sources for the signals *main reference value 0* to *2*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D211** Bit 7 to Bit 9 is used as the source. The control word can be written via fieldbus. The signal is indicated in **D318** regardless of the selected source. *Main reference value 0* to *2* (Binary / Decimal) → Reference value 000 / 0 → *Ref value external* 001 / 1 → *Preset ref value* 010 / 2 → *Correct ref1* 011 / 3 → *Motorized pot* 100 / 4 → *Correct ref2* 101 / 5 → *PID* 110 / 6 → *n-actual* **NOTE** With binary coding, the signal *main reference value 0* supplies the LSB and *main reference value 2* supplies the MSB. *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1D 80 00 hex	2676h Array	0h
D118.1 Axis, OFF r=1, w=1	**main ref value source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1D 80 01 hex	2676h Array	1h
D118.2 Axis, OFF r=1, w=1	**main ref value source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1D 80 02 hex	2676h Array	2h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D119 Axis, OFF r=1, w=1	**Edge enable main ref value source:** When the main reference value is switched during operation, the change must be accepted with an enable signal. The enable can be level or edge-controlled. To obtain acceptance, either a positive edge must be determined for the signal *enable main ref value (edge)* or a HIGH level must be determined for the signal *enable main ref value (level)*. The parameter **D119** specifies the source for the signal *edge enable main ref value*. The selections *0:low* and *1:high* correspond to fixed signal levels. The signal *enable main ref value (edge)* cannot be used with these selections. When the selection is *2:parameter*, the control word **D211** Bit10 is used as the source. The control word can be written via fieldbus. Regardless of the source selected, the signal is indicated in **D319**. If the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D419**.0 and a "switch off" delay in **D419**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1D C0 00 hex	2677h	0h
D120 Axis, OFF r=1, w=1	**Level enable main ref value source:** When the main reference value is switched during operation, the change must be accepted with an enable signal. The enable can be level or edge-controlled. To obtain acceptance, either a positive edge must be determined for the signal *enable main ref value (edge)* or a HIGH level must be determined for the signal *enable main ref value (level)*. The parameter **D120** specifies the source for the signal *level enable main ref value*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D211** Bit11 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D320**. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D420**.0 and a "switch off" delay in **D420**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;*	2678h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	8: BE3-inverted; *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1E 00 00 hex		
D124.0 Axis, OFF r=1, w=1	**Preset reference source:** A preset reference value is selected binary coded with the signals *preset reference 0* to *3*. The parameters **D124.0** to **D124.3** specify the sources for the signals *preset reference 0* to *3*. The selections *0:low* and *1:high* correspond to fixed signal levels. The control word **D212** Bit0 to Bit3 is used as the source for the selection *2:parameter*. The control word can be written via fieldbus. The number of the selected preset reference value is indicated in **D324**. **NOTE** When preset reference values and fixed values are addressed via fieldbus, only eight preset reference values are available. In this case, **D212** Bit3 is evaluated as fixed value 0. When only preset reference values are addressed in fieldbus mode, 16 preset reference values are available. *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 00 00 hex	267Ch Array	0h
D124.1 Axis, OFF r=1, w=1	**preset reference source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 00 01 hex	267Ch Array	1h
D124.2 Axis, OFF r=1, w=1	**preset reference source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 00 02 hex	267Ch Array	2h
D124.3 Axis, OFF r=1, w=1	**preset reference source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 00 03 hex	267Ch Array	3h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D125.0 Axis, OFF r=1, w=1	**Fix reference source:** A fix reference value is selected binary coded with the signals *fix reference 0* to *2*. The parameters **D125.0** to **D125.2** specify the sources for the signals *fix reference 0* to *2*. The selections *0:low* and *1:high* correspond to fixed signal levels. The control word **D212** Bit3 to Bit5 is used as the source for the selection *2:parameter*. The control word can be written via fieldbus. The number of the selected fix reference value is indicated in **D325**. **NOTE** When preset reference values and fixed values are addressed via fieldbus, only eight preset reference values are available. In this case, **D212** Bit3 is evaluated as fixed value 0. When only preset reference values are addressed in fieldbus mode, 16 preset reference values are available. Fixed values can only be selected as adding and multiplying reference values (**D31** and **D33**). *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 40 00 hex	267Dh Array	0h
D125.1 Axis, OFF r=1, w=1	**fix reference source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 40 01 hex	267Dh Array	1h
D125.2 Axis, OFF r=1, w=1	**fix reference source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 40 02 hex	267Dh Array	2h
D126.0 Axis, OFF r=1, w=1	**Preset ref accelerating source:** When the parameter **D13** is set to *2:binary signals*, an acceleration ramp is selected with the signals *preset ref acc selected 0* to *3*. The parameters **D126.0** to **D126.3** specify the sources for the signals *preset ref acc selected 0* to *3*. The selections *0:low* and *1:high* correspond to fixed signal levels. The control word **D212** Bit6 to Bit9 is used as the source when *2:parameter* is selected. The control word can be written via fieldbus. The number of the preset ref accelerating ramp is indicated in **D326**. *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 80 00 hex	267Eh Array	0h
D126.1 Axis, OFF r=1, w=1	**preset ref accelerating source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 80 01 hex	267Eh Array	1h
D126.2 Axis, OFF r=1, w=1	**preset ref accelerating source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 80 02 hex	267Eh Array	2h
D126.3 Axis, OFF r=1, w=1	**preset ref accelerating source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F 80 03 hex	267Eh Array	3h
D127.0 Axis, OFF r=1, w=1	**Preset ref decelerating source:** When the parameter **D13** is set to *2:binary signals*, a decelerating ramp is selected with *preset ref dec selected 0* to *3*. The parameters **D127.0** to **D127.3** specify the sources for the signals *preset ref dec selected 0* to *3*. The selections *0:low* and *1:high* correspond to fixed signal levels. The control word **D212** Bit10 to Bit13 is used as the source when *2:parameter* is selected. The control word can be written via fieldbus. The number of the preset ref decelerating ramp is indicated in **D327**. *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F C0 00 hex	267Fh Array	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D127.1 Axis, OFF r=1, w=1	**preset ref decelerating source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F C0 01 hex	267Fh Array	1h
D127.2 Axis, OFF r=1, w=1	**preset ref decelerating source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F C0 02 hex	267Fh Array	2h
D127.3 Axis, OFF r=1, w=1	**preset ref decelerating source** *Value range: 0 ... 0: Low ... 28* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 1F C0 03 hex	267Fh Array	3h
D128 Axis, OFF r=1, w=1	**Edge enable PR/FR source:** After a switch of the preset reference values, fixed values, or accelerating or decelerating ramps, the change must be accepted by an enable signal. The enable is given when either a positive edge is determined for the signal e*dge enable PR/FR* or a HIGH level is determined for the signal *level enable PR/FR*. The parameter **D128** specifies the source for the signal *edge enable PR/FR*. The selections *0:low* and *1:high* correspond to fixed signal levels. Das Signal *edge enable PR/FR* kann mit diesen Auswahlen nicht verwendet werden. When the selection is *2:parameter,* the control word **D212** Bit14 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D328**. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D428**.0 and a "switch off" delay in **D428**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 20 00 00 hex	2680h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D129 Axis, OFF r=1, w=1	**Level enable PR/FR source:** After a switch of the preset reference values, fixed values, or accelerating or decelerating ramps, the change must be accepted by an enable signal. The enable is given when either a positive edge is determined for the signal e*dge enable PR/FR* or a HIGH level is determined for the signal *level enable PR/FR*. The parameter **D129** specifies the source for the signal *level enable PR/FR*. The selections *0:low* and *1:high* correspond to fixed signal levels. When the selection is *2:parameter,* the control word **D212** Bit15 is used as the source. The control word can be written via fieldbus. Regardless of the selected source, the signal is indicated in **D329**. When the signal is to be processed with time delay, a "switch on" delay can be parameterized in **D429**.0 and a "switch off" delay in **D429**.1. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 20 40 00 hex	2681h	0h
D130 Axis, OFF r=1, w=1	**Reference value source:** Selection of the source for the "relative reference value" signal. The signal can be permanently specified as supplied by the analog inputs or the fieldbus. With **D130**=*4:Parameter,* the (global) parameter **D230** is used as the signal source. It can be written for use with a fieldbus system. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 20 80 00 hex	2682h	0h
D132 Axis, OFF r=1, w=1	**Reference external source:** Selection of the source for the signal *ref value external*. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D132**=*4:parameter,* the parameter **D232** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D332** regardless of the selected source. Scaling is done in the parameters **D51**.0, **D52**.0, **D53**.0 and **D54**.0. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 21 00 00 hex	2684h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D133 Axis, OFF r=1, w=1	**Correktion ref value 1 source:** Selection of the source for the signal *correktion ref value 1*. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D133**=*4:parameter,* the parameter **D233** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D333** regardless of the selected source. Scaling is done in the parameters **D51**.1, **D52**.1, **D53**.1 and **D54**.1. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 21 40 00 hex	2685h	0h
D134 Axis, OFF r=1, w=1	**Correktion ref value 2 source:** Selection of the source for the signal *correktion ref value 2*. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D134**=*4:parameter,* the parameter **D234** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D334** regardless of the selected source. Scaling is done in the parameters **D51**.2, **D52**.2, **D53**.2 and **D54**.2. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 21 80 00 hex	2686h	0h
D135 Axis, OFF r=1, w=1	**Jog ref value source:** Selection of the source for the signal *jog ref value*. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D135**=*4:parameter,* the parameter **D235** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D335** regardless of the selected source. Scaling is done in the parameters **D51**.3, **D52**.3, **D53**.3 and **D54**.3. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 21 C0 00 hex	2687h	0h
D136 Axis, OFF r=1, w=1	**Max V+ torque control source:** Selection of the source for the signal *max. V+ torque control*. It supplies the value for the positive speed limit during torque control. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D136**=*4:parameter,* the parameter **D236** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D336** regardless of the selected source. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 22 00 00 hex	2688h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D137 Axis, OFF r=1, w=1	**Max V- torque control source:** Selection of the source for the signal *max. V- torque control*. It supplies the value for the negative speed limit during torque control. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D137**=*4:parameter,* the parameter **D237** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D337** regardless of the selected source. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 22 40 00 hex	2689h	0h
D138 Axis, OFF r=1, w=1	**Max V+ speed control source:** Selection of the source for the signal *max. V+ speed control*. It supplies the value for the positive speed limit during speed control. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D138**=*4:parameter,* the parameter **D238** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D338** regardless of the selected source. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 22 80 00 hex	268Ah	0h
D139 Axis, OFF r=1, w=1	**Max V- speed control source:** Selection of the source for the signal *max. V- speed control*. It supplies the value for the negative speed limit during speed control. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D139**=*4:parameter,* the parameter **D239** is used as the signal source. It can be written in fieldbus mode. The signal is indicated in **D339** regardless of the selected source. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 22 C0 00 hex	268Bh	0h
D140 Axis, OFF r=1, w=1	**Master reference source:** Selection of the source for the signal *master reference*. This signal can be used to implement a master-slave relationship via an analog coupling. The signal can be permanently preset and can be supplied by the analog inputs or the fieldbus. When **D140**=*4:parameter,* the parameter **D240** is used as the signal source. It can be written in fieldbus mode. The reference value is specified for each source as a percentage. This reference value is indicated in **D340** as related to **D56**. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 23 00 00 hex	268Ch	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D180 Axis read (1)	**Standstill:** The signal is *1:active* when the speed actual value is within the window of ±**C40**. With fieldbus operation, the signal can be read in **D200** Bit 0. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2D 00 00 hex	26B4h	0h
D181 Axis read (1)	**Reference value reached:** Binary signal, assumes the value "1" when the input and output of the ramp generator differ by a maximum of 10 Rpm after expiration of the ramp. In the application for the "comfort reference value," the signal is also *1:active* when the output of the motorised pot is constant. The signal can only be set when the enable has been given. With fieldbus operation, the signal can be read in **D200** Bit 1. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2D 40 00 hex	26B5h	0h
D182 Axis read (1)	**Torque limit:** Binary signal, assumes the value "1" when the required torque exceeds the maximum permissible torque (**C03**, **C05**, **C330**, **C331**, **C332**, **C333**). **D182** triggers for negative and positive limit. When positive and negative limit must be distinguished between, use **E180** and **E181**. To distinguish between motoring and generating limits, **E186** and **E187** must be read. With fieldbus operation, the signal can be read in **D200** Bit 2. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2D 80 00 hex	26B6h	0h
D183 Axis read (1)	**Actual value reached:** The parameter **D183** is *1:active* when the motor speed (**E91** n-motor) has reached the reference value specification (**E07** n-post-ramp) ± **C40** n-window. The signal can be read in **D200** Bit 9 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2D C0 00 hex	26B7h	0h
D184 Axis read (1)	**Ref value prohibited:** A positive or negative reference value is specified when the level is high although the applicable motor direction is prohibited (**D308** = *1:active* or **D309** = *1:active*). The signal can be read in **D200** Bit 10 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2E 00 00 hex	26B8h	0h
D185 Axis read (1)	**Max speed limit reached:** When the level is high, the reference value has reached the speed limit which is indicated in **D336** (torque control) or **D338** (speed control). The signal can be queried in **D200** Bit 11 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2E 40 00 hex	26B9h	0h
D186 Axis read (1)	**Min speed limit reached:** When the level is high, the reference value has reached the speed limit which is indicated in **D337** (torque control) or **D339** (speed control). The signal can be queried in **D200** Bit 12 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2E 80 00 hex	26BAh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D187 Axis read (1)	**Motorised pot step reached:** Indication of the signal depends on **D43**. When the value 0 is entered in **D43**, the motor pot reference value changes continuously. The signal *motorized pot out constant* has a high level when the signals *motorized pot UP* and *motorized pot DOWN* are simultaneously inactive or active. When **D43** contains a value other than 0, the changes in reference value take place in steps. The signal is *1:active* when a step has been completed and *0:inactive* when a new step has been started. The signal can be read in **D200** Bit 13 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2E C0 00 hex	26BBh	0h
D188 Axis read (1)	**Motorised pot lim reached:** When the level is high, the motorized pot reference value has reached the value in **D45** or **D46**. The signal can be read in **D200** Bit 14 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2F 00 00 hex	26BCh	0h
D189 Axis read (1)	**Zero ramp reached:** When the level is high, the ramp generator has reached the value 0. The signal can be read in **D200** Bit 15 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2F 40 00 hex	26BDh	0h
D190 Axis read (1)	**Range control 1 red below: D190** is *1:active* when the value indicated in **D69** is below the limit entered in **D64** (**D69** < **D64**). The application event 0 is triggered at the same time (parameters **U100** to **U102**). The signal can be queried in **D202** Bit 0 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2F 80 00 hex	26BEh	0h
D191 Axis read (1)	**Range control 1 yellow below: D191** is *1:active* when the value indicated in **D69** is between the values **D64** and **D65** (**D64** < **D69** < **D65**). The signal can be queried in **D202** Bit 1 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 2F C0 00 hex	26BFh	0h
D192 Axis read (1)	**Range control 1 green: D192** is *1:active* when the value indicated in **D69** is between the values **D65** and **D66** (**D65** < **D69** < **D66**). The signal can be queried in **D202** Bit 2 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 30 00 00 hex	26C0h	0h
D193 Axis read (1)	**Range control 1 yellow above: D193** is *1:active* when the value indicated in **D69** is between the values **D66** and **D67** (**D66** < **D69** < **D67**). The signal can be queried in **D202** Bit 3 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 30 40 00 hex	26C1h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D194 Axis read (1)	**Range control 1 red above: D194** is *1:active* when the value indicated in **D69** is above the limit entered in **D67** (**D69** > **D67**). The application event 1 is triggered at the same time (parameters **U110** to **U112**). The signal can be queried in **D202** Bit 4 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 30 80 00 hex	26C2h	0h
D195 Axis read (1)	**Range control 2 red below: D195** is *1:active* when the value indicated in **D79** is below the limit entered in **D74** (**D79** < **D74**). The application event 2 is triggered at the same time (parameters **U120** to **U122**). The signal can be queried in **D202** Bit 5 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 30 C0 00 hex	26C3h	0h
D196 Axis read (1)	**Range control 2 yellow below: D196** is *1:active* when the value indicated in **D79** is between the values **D74** and **D75** (**D74** < **D79** < **D75**). The signal can be queried in **D202** Bit 6 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 31 00 00 hex	26C4h	0h
D197 Axis read (1)	**Range control 2 green: D197** is *1:active* when the value indicated in **D79** is between the values **D75** and **D76** (**D75** < **D79** < **D76**). The signal can be queried in **D202** Bit 7 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 31 40 00 hex	26C5h	0h
D198 Axis read (1)	**Range control 2 yellow above: D198** is *1:active* when the value indicated in **D79** is between the values **D76** and **D77** (**D76** < **D79** < **D77**). The signal can be queried in **D202** Bit 8 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 31 80 00 hex	26C6h	0h
D199 Axis read (1)	**Range control 2 red above: D199** is *1:active* when the value indicated in **D79** is above the limit entered in **D77** (**D79** > **D77**). The application event 3 is triggered at the same time (parameters **U130** to **U132**). The signal can be queried in **D202** Bit 9 via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 31 C0 00 hex	26C7h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D200 Global read (2)	**Speed reference value status word:** This byte contains status signals of the application. With the application for the fast reference value, only bits 0 to 2 are used. Bits 3 to 15 can only be used with the application for comfort reference value. The parameter which is specified for the bit names indicates the individual parameter in which the signals can also be viewed. Bit 0: *Standstill* (**D180**). The actual motor speed has reached the value 0 Rpm ±**C40**. Bit 1: *Reference value reached* (**D181**): The ramp generator has reached its reference value. Bit 2: *Torque limit (static)* (**D182**). The positive or negative torque limit is reached. Bit 3: *Status positive T-limit* (**E180**): The positive torque limit has triggered with the high level. Bit 4: *Status negative T-limit* (**E181**): The negative torque limit has triggered with the high level. Bit 5: *Status motoring T-limit* (**E186**): The motoring torque limit has triggered with the high level. Bit 6: *Status generating T-limit* (**E187**): The generating torque limit has triggered with the high level. Bit 7: *PID upper limit* (**G181**): With the high level, the PID controller has reached the value in **G08** on the output. Bit 8: *PID lower limit* (**G182**): With the high level, the PID controller has reached the value in **G09** on the output. Bit 9: *Actual value reached* (**D183**): With the high level, the motor speed has reached the reference value specification ±**C40**. Bit 10: *Ref. value prohibited* (**D184**):With the high level, a reference value is specified in prohibited direction of rotation. Bit 11: *Max. speed limit reached* (**D185**): With the high level, the reference value has reached the positive speed limit (with torque control **D336**, speed control **D338**). Bit 12: *Min. speed limit reached* (**D186**): With the high level, the reference value has reached the negative speed limit (with torque control **D337**, speed control **D339**). Bit 13: *Motorised pot step reached* (**D187**): With the high level, no change takes place in the motorized pot reference value. Bit 14: *Motorised pot lim reached* (**D188**): With the high level, the motorized pot reference value has reached the value in **D45** or **D46**. Bit 15: *Zero ramp reached* (**D189**): With the high level, the ramp generator has reached the value 0. Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 04 32 00 00 hex	26C8h	0h
D201 Global read (2)	**Speed ref. value status word 2:** This byte contains status signals of the "comfort reference value" application. The parameter specified in the bit names indicates the individual parameter in which the signal can also be viewed. Bit 0: *Reverse* (**D300**): Indication of the signal regardless of the source set in **D100**. Bit 1: *Actual value direction* (**D430**): Indication of the direction at the end of the reference value path and before **D57**; low = positive reference value, high = negative reference value. Bit 2: *Brake open* (**D431**): When the level is high, the brake is open. The signal becomes inactive when the brake begins to close. Bit 3: *Brake closed* (**D432**): When the level is high, the brake is closed. The signal becomes inactive when the brake begins to open. Bit 4: *Scan active* (**D433**): When the level is high, the drive is in scan active mode as per **C20**. Bit 5: *Heavy duty starting* (**D434**): When the level is high, the drive is in heavy duty starting as per **C20**. Bit 6: *Ref value ready* (**D435**): When the level is high, the inverter is enabled and the brake is open. Bit 7: *Torque limit motoring / generating* (**D436**): When the level is high, the torque limits are specified via motor and generator (i.e., **C332** and **C333** are not zero). Bit 8: *Jog active* (**D437**): Jog mode is active. This means: - The jog enable (**D105**) or the jog reference value enable (**D55** Bit 3 and **D113** *additional enable 2*) is active. - A stop signal is queued. - And the motor speed has reached the range -**C40** to +**C40** once.	26C9h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	Bit 9: *Stop active* (**D438**): When the level is high, a stop signal is queued (**D302**) and the motor speed has reached the range -**C40** to +**C40** once. Bit 10: *Skip active* (**D439)**: When the level is high, the motor speed is in the skip range (**C10**.X, **C11**.X). Bit 11: *Positive torque active* (**D440**): When the level is high, the current motor torque (**E90**) is greater than 5% in relation to the user inverting motor direction (**D57**). Bit 12: *Negative torque active* (**D441**): When the level is high, the current motor torque (**E90**) is less than -5% in relation to the user inverting motor direction (**D57**). Bit 13: *Forward direction* (**D442**): When the level is high, the velocity (**E91**) is greater than **C40** in relation to the user direction. Bit 14: *Accelerating* (**D443**): When the level is high, the motor speed increases. Bit 15: *Decelerating* (**D444**): When the level is high, the motor speed decreases. Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 04 32 40 00 hex		
D202 Global read (2)	**Speed ref. value status word 3:** This byte contains status signals of the "comfort reference value" application. The parameter specified in the bit names indicates the individual parameter in which the signal can also be viewed. Bit 0: *Range control 1 red below* (**D190**): The signal is *1:active* when the value indicated in **D69** is below the limit entered in **D64** (**D69** < **D64**). Bit 1: *Range control 1 yellow below* (**D191**): The signal is *1:active* when the value indicated in **D69** is between the values in **D64** and **D65** (**D64** < **D69** < **D65**). Bit 2: *Range control 1 green* (**D192**): The signal is *1:active* when the value indicated in **D69** is between the values in **D65** and **D66** (**D65** < **D69** < **D66**). Bit 3: *Range control 1 yellow above* (**D193**): The signal is *1:active when the value indicated in* **D69** is between the values in **D66** and **D67** (**D66** < **D69** < **D67**). Bit 4: *Range control 1 red above* (**D194**): The signal is *1:active* when the value indicated in **D69** is above the limit entered in **D67** (**D69** > **D67**). Bit 5: *Range control 2 red below* (**D195**): The signal is *1:active* when the value indicated in **D79** is below the limit entered in **D74** (**D79** < **D74**). Bit 6: *Range control 2 yellow below* (**D196**): The signal is *1:active* when the value indicated in **D79** is between the values in **D74** and **D75** (**D74** < **D79** < **D75**). Bit 7: *Range control 2 green* (**D197**): The signal is *1:active* when the value indicated in **D79** is between the values in **D75** and **D76** (**D75** < **D79** < **D76**). Bit 8: *Range control 2 yellow above* (**D198**): The signal is *1:active* when the value indicated in **D79** is between the values in **D76** and **D77** (**D76** < **D79** < **D77**). Bit 9: *Range control 2 red above* (**D199**): The signal is *1:active* when the value indicated in **D79** is above the limit entered in **D77** (**D79** > **D77**). Bit 10: *External fault* (**D301)**: When the level is high, an external signal is queued to trigger a fault. Bit 11: *Event A active* (**D460**): When the level is high, the event entered in **D90** has occurred. Bit 12: *Event B active* (**D461**): When the level is high, the event entered in **D91** has occurred. Bit 13: *Limit switch active* (**D462**): When the level is high, one of the limit switches has tripped (**D303** or **D304**). Bit 14: *Warning active* (**D463**): When the level is high, a warning was determined (**E81**=2). Bit 15: *Switch on inhibit* (**D464**): When the level is high, the inverter is in the device state "switch on inhibit" (**E48** = 1). Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 04 32 80 00 hex	26CAh	0h
D210 Global r=2, w=2	**Speed reference value control word:** This word contains reference value signals to the application. In the application for the fast reference value, only bits 0 and 1 can be used. Bits 2 to 13 are exclusively for use with the application for the comfort reference value. The parameter which is specified with the bit names specifies the indication parameter which shows the signal regardless of its source. Bit 0: *Reverse* (**D300**): With the high level, the reference value is negated before the addition with *n-reference high resolution* takes place. Bit 1: *External fault* (**D301**): With the high level, the fault *"44:externalfault1"* is triggered. Bit 2: *Stop* (**D302**): With the high level, reference value 0 is specified and the motor stops. Bit 3: *Limit switch+* (**D303**): With the high level, an event is triggered. In the standard, the	26D2h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
	inverter switches to the fault state. Bit 4: *Limit switch-* (**D304**): With the high level, an event is triggered. In the standard, the inverter switches to the fault state. Bit 5: *Jog enable* (**D305**): If the drive reaches standstill (speed in window ±**C40**) with an active *Stop* signal, jogging mode is enabled with the high level. Bit 6: *Jog+ source* (**D306**): When jogging mode is enabled, the *jog reference value* signal is output unchanged with the active signal. Bit 7: *Jog- source* (**D307**): When jogging mode is enabled, the *jog reference value* signal is output negated with the high level. Bit 8: *Positive blocking* (**D308**): With the high level, no positive reference value is processed. Bit 9: *Negativ blocking* (**D309**): With the high level, no negative reference value is processed. Bit 10: *Torque switch* (**D310**): The signal is used to switch between the absolute torque limits. With the low level, *torque limit* is valid (**C330**). With the high level, *torque limit 2* is active (**C331**). Bit 11: *Master / slave switch* (**D311**): With the high level, the *master reference* (**D340**) is active. Bit 12: *Speed / torque switch* (**D312**): The signal is used to switch between speed and torque control. With the low level, speed control is active. With the high level, torque control is used. Bit 13: *Additional enable 2* (**D313**): The *Additional enable 2* signal is logically linked with the reference value enables. With the high level, one of the reference value enables must also exist before the drive is enabled. Bit 14, Bit 15: Reserved *Value range: 0 ... 0000000000000000bin ... 65535 (Representation binary)* Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 04 34 80 00 hex		
D211 Global r=2, w=2	**Speed ref. value control word 2:** This word contains reference value signals to the "comfort reference value" application. The parameter specified with the bit names specifies the indication parameter which the signal indicates regardless of its source. Bit 0: *Motorized pot up* (**D314**): When the level is high, the motorized reference value is increased in steps or continuously based on **D43**. Bit 1: *Motorized pot down* (**D315**): When the level is high, the motorized reference value is decreased in steps or continuously based on **D43**. Bit 2: *Motorized pot mode* (**D316**): A high level sets the motorized pot reference value to the value entered in **D44**. Bit 3: *Motorized pot ramp* (**D317**): When **D40** Bit7 is active, you can switch between the ramps **D41** and **D42** with the signal. When the level is low, **D41** is active. When the level is high, **D42** is used. Bit 4: *Negate technology reference value* (**G300**): When the level is high, the PID reference value is negated. Bit 5: *PID controller disable* (**G301**): When the level is high, the PID controller is turned off. Bit 6: *PID Mode* (**G302**): When the level is high, the PID controller mode is set as per **G14**. Bit 7: *Main ref select 0* (**D318**). The main reference value select signals can be used during operation to switch (binary-coded) between various main reference value sources (e.g., ref value external or motorized pot). The selection with the selectors takes precedence over the setting in **D30**. Bit 8: *Main ref select 1* (**D318**): See bit 7. Bit 9: *Main ref select 2* (**D318**): See bit 7. Bit 10: *Enable main ref value (edge)* (**D319**): A switchover of the main reference value becomes active with a rising edge. Bit 11: *Enable main ref value (level)* (**D320**): A switchover of the main reference value becomes active with a high level. Bit 12 to Bit 15: Reserved *Value range: 0 ... 0000000000000000bin ... 65535 (Representation binary)* Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 04 34 C0 00 hex	26D3h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D212 Global r=2, w=2	**Speed ref. value control word 3:** This word contains reference value signals to the "comfort reference value" application. The parameter specified with the bit names specifies the indication parameter which the signal indicates regardless of its source. Bit 0: *Preset ref selected 0* (**D324**): The preset reference values are switched between (binary-coded) with the signals *preset ref selected 0* to *3*. Bit 1: *Preset ref selected 1* (**D324**): See bit 0. Bit 2: *Preset ref selected 2* (**D324**): See bit 0. Bit 3: *Preset ref selected 3* (**D324**) / *fix ref selected 0* (**D325**): This bit has a double function. When the preset reference values and fixed values are switched via fieldbus, the signal is evaluated as *fix ref selected 0* (for function, see bit 4). This means that eight preset reference values and fixed values each are available. When the fixed values are accessed via terminals or no fixed values are used at all, the signal is evaluated as *preset ref selected 3* (for function, see bit 0). In this case, 16 preset reference values are accessed. Bit 4: *Fix ref selected 1* (**D325**): The fixed values are switched between (binary-coded) with the signals *Fix ref selected 0* to *2*. Bit 5: *Fix ref selected 2* (**D325**): See bit 4. Bit 6: *Preset ref acc selected 0* (**D326**): When the parameter **D13** is set to *2:binary signals*, the signals *preset ref acc selected 0* to *3* are used to assign (binary-coded) an acceleration ramp to the current preset reference value. Bit 7: *Preset ref acc selected 1* (**D326**): See bit 6. Bit 8: *Preset ref acc selected 2* (**D326**): See bit 6. Bit 9: *Preset ref acc selected 3* (**D326**): See bit 6. Bit 10: *Preset ref dec selected 0* (**D327**): When the parameter **D13** is set to *2:binary signals*, the signals *preset ref dec selected 0* to *3* are used to assign (binary-coded) a deceleration ramp to the current preset reference value. Bit 11: *Preset ref dec selected 1* (**D327**): See bit 10. Bit 12: *Preset ref dec selected 2* (**D327**): See bit 10. Bit 13: *Preset ref dec selected 3* (**D327**): See bit 10. Bit 14: *Edge enable PR/FR* (**D328**): A switchover of the fixed values, preset reference values or preset reference value ramps becomes active with a rising edge. Bit 15: *Level enable PR/FR* (**D329**): A switchover of the fixed values, preset reference values or preset reference value ramps becomes active with a high level. *Value range: 0 ... 0000000000000000bin ... 65535 (Representation binary)* Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 04 35 00 00 hex	26D4h	0h
D230 Global r=2, w=2	**n-reference value relative:** Relative speed reference value of the application quick reference value as related to **D02**. Is added to high-resolution speed reference value **D231.** The reverse signal (**D100**, **D210**.0) negates **D230**. *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 39 80 00 hex	26E6h	0h
D231 Global r=2, w=2	**n-reference value high resolution:** High-resolution speed reference value of the application quick reference value. The function differs in the applications "fast reference value" and "comfort reference value." Fast reference value: The reference value Is added to relative reference value **D230.** The reverse signal (**D100**, **D210**.0) has no effect on **D231**. Comfort reference value: For an exact description of the *n-reference high resolution* signal, please see the application description of the comfort reference value, impr.-no. 441883. *Value range in rpm: -131072.000 ... 0,000 ... 131072.000* Fieldbus: 1LSB=0,001rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 04 39 C0 00 hex	26E7h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D232 Global r=2, w=2	**Reference value external:** Specification for the signal *ref value external* via fieldbus if the signal source is **D132**=*4:parameter*. *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 3A 00 00 hex	26E8h	0h
D233 Global r=2, w=2	**Correktion ref value 1:** Specification for the signal *correktion ref value 1* via fieldbus if the signal source is **D133**=*4:parameter*. *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 3A 40 00 hex	26E9h	0h
D234 Global r=2, w=2	**Correktion ref value 2:** Specification for the signal *correktion ref value 2* via fieldbus if the signal source is **D134**=*4:parameter*. *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 3A 80 00 hex	26EAh	0h
D235 Global r=2, w=2	**Jog ref value:** Specification for the signal *jog ref value* via fieldbus if the signal source is **D135**=*4:parameter*. *Value range in %: -200.0 ... 10,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 3A C0 00 hex	26EBh	0h
D236 Axis r=2, w=2	**Max speed+ torque control:** Specification for the signal *max speed+ torque control* via fieldbus if the signal source is **D136**=*4:parameter*. **NOTE** This parameter is shown in rpm. *Value range in rpm: -8191 ... 3000 ... 8191* Fieldbus: 1LSB=1rpm; Type: I16; (raw value:32767 = 8191 rpm); USS-Adr: 04 3B 00 00 hex	26ECh	0h
D237 Axis r=2, w=2	**Max speed- torque control:** Specification for the signal *max speed- torque control* via fieldbus if the signal source is **D137**=*4:parameter*. **NOTE** This parameter is shown in rpm. *Value range in rpm: -8191 ... -3000 ... 8191* Fieldbus: 1LSB=1rpm; Type: I16; (raw value:32767 = 8191 rpm); USS-Adr: 04 3B 40 00 hex	26EDh	0h
D238 Axis r=2, w=2	**Max speed+ speed control:** Specification for the signal *max speed+ speed control* via fieldbus if the signal source is **D138**=*4:parameter*. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -8192 ... 3000 ... 8192* Fieldbus: 1LSB=siehe D86; PDO ; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 3B 80 00 hex	26EEh	0h
D239 Axis r=2, w=2	**Max speed- speed control:** Specification for the signal *max speed- speed control* via fieldbus if the signal source is **D139**=*4:parameter*. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. *Value range in D89: -8192 ... -3000 ... 8192* Fieldbus: 1LSB=siehe D86; PDO ; Type: I16; raw value:1LSB=Fnct.no.17; USS-Adr: 04 3B C0 00 hex	26EFh	0h
D240 Global r=2, w=2	**Master reference:** Specification for the signal *master reference* via fieldbus if the signal source is **D140**=*4:parameter*. *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 3C 00 00 hex	26F0h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D249 Axis read (3)	**Measure.unit:** Read only. Internally used text. Derived from the text in **D89**. "/s" is added to the text in **D89**. Is used as units string for user speeds. *Default setting: Upm/s* Fieldbus: Type: Str8; USS-Adr: 04 3E 40 00 hex	26F9h	0h
D300 Axis read (2)	**Reverse:** Indicator parameter for the current signal state on the input of the speed block (*reverse*). **D300** shows the state regardless of the source selected in **D100**. In the "comfort reference value" application, the signal can be read in **D201** Bit 0 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: B; USS-Adr: 04 4B 00 00 hex	272Ch	0h
D301 Axis read (2)	**External fault:** Indicator parameter for the current signal state on the input of the speed block (*extFault*). **D301** shows the status regardless of the source selected in **D101**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: B; USS-Adr: 04 4B 40 00 hex	272Dh	0h
D302 Axis read (2)	**Stop:** Indicates the signal *stop* regardless of the source selected in **D102**. When the *stop* signal is active, the reference value 0 is specified for the drive. The motor stops. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4B 80 00 hex	272Eh	0h
D303 Axis read (2)	**Limit switch+:** Indicates the signal *limit switch+* regardless of the source selected in **D103**. When the signal *limit switch* + is active, an event is triggered. The standard reaction is that the device assumes the "fault" state. The direction after the limit switch is passed over is blocked. After the fault is acknowledged, the drive can continue in the direction opposite from the switch. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4B C0 00 hex	272Fh	0h
D304 Axis read (2)	**Limit switch-:** Indicates the signal *limit switch-* regardless of the source selected in **D104**. When the signal *limit switch-* is active, an event is triggered. The standard reaction is that the device assumes the "fault" state. The direction after the limit switch is passed over is blocked. After the fault is acknowledged, the drive can continue in the direction opposite from the switch. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4C 00 00 hex	2730h	0h
D305 Axis read (2)	**Jog enable:** Indicates the signal *jog enable* regardless of the source selected in **D105**. When the drive comes to a standstill with an active *stop* signal (motor speed in window ±**C40**), jog mode can be enabled with *jog enable*. The parameter **D105** specifies the source for the signal. The selections *0:low* and *1:high* correspond to fixed signal levels. When *2:parameter* is selected, the control word **D210** Bit5 is used as the source. The control word can be written via fieldbus. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4C 40 00 hex	2731h	0h
D306 Axis read (2)	**Jog+ source:** Indication of the signal *jog* + regardless of the source selected in **D106**. When jog mode is enabled, the signal *jog ref value* is output unchanged when the signal *jog* + is active. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4C 80 00 hex	2732h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D307 Axis read (2)	**Jog- source:** Indication of the signal *jog* - regardless of the source selected in **D107**. When jog mode is enabled, the signal *jog ref value* is output negated when the signal *jog* + is active. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4C C0 00 hex	2733h	0h
D308 Axis read (2)	**Positive blocking:** Indicates the signal *positive blocking* regardless of the source selected in **D108**. When the signal *positive blocking* assumes the value *1:active*, positive reference values are not processed. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4D 00 00 hex	2734h	0h
D309 Axis read (2)	**Negativ blocking:** Indicates the signal *negative blocking* regardless of the source selected in **D109**. When the signal *negative blocking* assumes the value *1:active*, negative reference values are not processed. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4D 40 00 hex	2735h	0h
D310 Axis read (2)	**Torque switch:** The signal *torque switch* can be used to switch between the absolute torque limits *torque limit* and *torque limit 2*. When the level is low, *torque limit* is active. When the level is high, *torque limit 2* is used. **D310** shows the signal regardless of the source selected in **D110**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4D 80 00 hex	2736h	0h
D311 Axis read (2)	**Master / slave switch:** Indication of the signal *master / slave switch* regardless of the source selected in **D111**. When the signal *master/slave switch* assumes the value *1:active*, the master reference value is processed (selector **D140**). *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4D C0 00 hex	2737h	0h
D312 Axis read (2)	**Speed / torque switch:** The signal *speed/torque switch* can be used to switch between speed and torque control. When the level is low, speed control is active. When the level is high, torque control is used. **D312** shows the signal regardless of the source selected in **D112**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4E 00 00 hex	2738h	0h
D313 Axis read (2)	**Additional enable 2:** Indication of the signal *additional enable 2* regardless of the source selected in **D113**. The signal *additional enable 2* is logically linked with the reference value enables. If these are activated (see **D55**), a*dditional enable 2,* a reference value enable and the device enables must assume the value *1:active* before the drive can be enabled. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4E 40 00 hex	2739h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D314 Axis read (2)	**Motorised pot up:** Indication of the signal *motorised pot up* regardless of the source selected in **D114**. A HIGH level of the signal *motorized pot up* increases the motorized pot reference value in steps or continuously based on **D43**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4E 80 00 hex	273Ah	0h
D315 Axis read (2)	**Motorised pot down:** Indication of the signal *motorised pot down* regardless of the source selected in **D115**. A HIGH level of the signal *motorized pot down* decreases the motorized pot reference value in steps or continuously based on **D43**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4E C0 00 hex	273Bh	0h
D316 Axis read (2)	**Motorised pot mode:** Indication of the signal *motorised pot mode* regardless of the source selected in **D116**. A HIGH level of the signal m*otorized pot mode* resets the motorized pot reference value to the value entered in **D44**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4F 00 00 hex	273Ch	0h
D317 Axis read (2)	**Motorized pot ramp:** When **D40** Bit7 is active, the signal *motorized pot ramp* can be used to switch between **D41** and **D42**. When the level is low, **D41** is used. When the level is high, the ramp **D42** is used. **D317** shows the signal regardless of the source selected in **D117**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4F 40 00 hex	273Dh	0h
D318 Axis read (2)	**Main ref select:** Indication of the signals *main ref select 0* to *2* (**D118**.x) as U8 parameters (Bit0 = *main ref select 0*, Bit1 = *main ref select 1*, Bit2 = *main ref select 2)*. Various main reference value sources can be selected during operation with the main reference value select signals (e.g., reference value, correction reference value or motorized potentiometer). The selection with the main reference value selectors takes precedence over the setting in **D30**. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 04 4F 80 00 hex	273Eh	0h
D319 Axis read (2)	**Edge enable main ref value:** Indication of the signal *edge enable main ref value* regardless of the source selected in **D119**. When the main reference value is switched during operation, the change must be accepted with an enable signal. The enable can be level or edge-controlled. To obtain an acceptance, either a positive edge must be determined for the signal *enable main ref value (edge)* or a HIGH level must be determined for the signal *enable main ref value (level)*. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 4F C0 00 hex	273Fh	0h
D320 Axis read (2)	**Level enable main ref value:** Indication of the signal *level enable main ref value* regardless of the source selected in **D120**. When the main reference value is switched during operation, the change must be accepted with an enable signal. The enable can be level or edge-controlled. To obtain an acceptance, either a positive edge must be determined for the signal *enable main ref value (edge)* or a HIGH level must be determined for the signal *enable main ref value (level)*. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 50 00 00 hex	2740h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D324 Axis read (2)	**Preset ref selected:** Indication of the signals *preset ref selected 0* to *3* as U8 parameters (in decimal representation). A preset reference value is selected (binary-coded) with the signals *preset ref selected 0* to *3*. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 04 51 00 00 hex	2744h	0h
D325 Axis read (2)	**Fix ref selected:** Indication of the signals *fix ref selected 0* to 2 as U8 parameters (in decimal representation). A fix reference value is selected (binary-coded) with the signals *fix ref selected 0* to 2. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 04 51 40 00 hex	2745h	0h
D326 Axis read (2)	**Preset ref acc selected:** Indication of the signals *preset ref acc select 0* to *3* as U8 parameters (Bit0 = *preset ref acc select 0*, Bit1 = *preset ref acc select 1*, Bit2 = *preset ref acc select 2*, Bit3 = *preset ref acc select 3)*. When the parameter **D13** is set to *2:binary signals*, an acceleration ramp is selected with the signals *preset ref acc selected 0* to *3*. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 04 51 80 00 hex	2746h	0h
D327 Axis read (2)	**Preset ref dec selected:** Indication of the signals *preset ref dec select 0* to 3 as U8 parameters (Bit0 = *preset ref dec select 0*, Bit1 = *preset ref dec select 1*, Bit2 = *preset ref dec select 2,* Bit3 = *preset ref dec select 3)*. When the parameter **D13** is set to *2:binary signals*, a decelerating ramp is selected with the signals *preset ref dec selected 0* to *3*. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 04 51 C0 00 hex	2747h	0h
D328 Axis read (2)	**Edge enable PR/FR:** Indication of the signal *edge enable PR/FR* regardless of the source selected in **D128**. After a switchover of the preset reference values, fixed values, and accelerating or decelerating ramps, the change must be accepted with an enable signal. The enable is given when either a positive edge is determined for the signal *edge enable PR/FR* or a HIGH level is determined for the signal *level enable PR/FR*. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 52 00 00 hex	2748h	0h
D329 Axis read (2)	**Level enable PR/FR:** Indication of the signal *level enable PR/FR* regardless of the source selected in **D129**. After a switchover of the preset reference values, fixed values, and accelerating or decelerating ramps, the change must be accepted with an enable signal. The enable is given when either a positive edge is determined for the signal *edge enable PR/FR* or a HIGH level is determined for the signal *level enable PR/FR*. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 52 40 00 hex	2749h	0h
D330 Axis read (2)	**n-reference value relative:** Indicator parameter for the current signal value on the input of the speed block (*RVrelat.*). **D330** shows the value regardless of the source selected in **D130**. When weighted with **D02**, this signal provides one component of the speed reference value. The high-resolution speed reference value (*RefVal*) is then added to this. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 52 80 00 hex	274Ah	0h
D331 Axis read (2)	**n-reference value high resolution:** Indicator parameter for the current signal value on the input of the quick reference value block (*RefVal*). The value of **D331** is added to the relative reference value. Fieldbus: 1LSB=0,001rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 04 52 C0 00 hex	274Bh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D332 Axis read (2)	**Reference value external:** Indication of the signal *reference value external* regardless of the source selected in **D132**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 53 00 00 hex	274Ch	0h
D333 Axis read (2)	**Correktion ref value 1:** Indication of the signal *correktion ref value 1* regardless of the source selected in **D133**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 53 40 00 hex	274Dh	0h
D334 Axis read (2)	**Correktion ref value 2:** Indication of the signal *correktion ref value 2* regardless of the source selected in **D134**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 53 80 00 hex	274Eh	0h
D335 Axis read (2)	**Jog ref value:** Indication of the signal *jog ref value* regardless of the source selected in **D135**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 53 C0 00 hex	274Fh	0h
D336 Axis read (2)	**Max V+ torque control:** Indication of the signal *max V+ torque control* regardless of the source selected in **D136**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 04 54 00 00 hex	2750h	0h
D337 Axis read (2)	**Max V- torque control:** Indication of the signal *max V- torque control* regardless of the source selected in **D137**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 04 54 40 00 hex	2751h	0h
D338 Axis read (2)	**Max V+ speed control:** Indication of the signal *max V+ speed control* regardless of the source selected in **D138**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 54 80 00 hex	2752h	0h
D339 Axis read (2)	**Max V- speed control:** Indication of the signal *max V- speed control* regardless of the source selected in **D139**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 54 C0 00 hex	2753h	0h
D340 Axis read (2)	**Master reference:** Indication of the signal *master reference* regardless of the source selected in **D140**. **NOTE** The reference value is specified as a percentage for each source. This reference value is indicated in **D340** as related to **D56**. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 55 00 00 hex	2754h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D370 Axis read (2)	**RV-acknowledge:** The parameter shows the selected reference value combination as decimal-coded. When this coding is used, a five-position decimal number (e.g., 16245) is indicated. The 100s position stands for the selected main reference value. The 10s position stands for the adding reference value and the 1s position stands for the factor reference value. The reference values are specified with the following numbers: 0: No reference value selected (only possible with adding and factor reference value) 1: Ref value external 2: Preset reference values/fixed values (fixed values only for adding and factor reference value) 3: Motorized potentiometer 4: Correction reference value 1 5: Correction reference value 2 6: PID control error 7: n-actual 8: Master reference (only for the 100s position) 9: Jog ref value Example: 105 = ref value external as main reference value (**D30**). Correction reference value 2 as factor reference value (**D33**). 345 = Motorized potentiometer as main reference value (**D30**). Correction reference value 1 as adding reference value (**D31**). Correction reference value 2 as factor reference value (**D33**). When the setting **D30** = 2 is used (preset reference values as main reference value), the currently selected preset reference value can be read out in the 1000s and 10000s position. Example: 8200 = Eight's preset reference value selected as main reference value (**D10**.7, **D11**.7) 16205 = Sixteen's preset reference value selected as main reference value (**D10**.15, **D11**.15). Correction reference value 2 selected as factor reference value. **NOTE** The master reference value cannot be set in **D30**. The signal *master/slave switch* (**D111**) must be used to select the master reference value. For this reason, an active master reference value is indicated in **D370** with the value 800. Fieldbus: 1LSB=1; PDO ; Type: I16; USS-Adr: 04 5C 80 00 hex	2772h	0h
D371 Axis read (2)	**Preset ref value:** The parameter shows the value of the current preset reference value (**D11**.x). **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 5C C0 00 hex	2773h	0h
D372 Axis read (2)	**Fix ref value:** The parameter shows the value of the current fixed value. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 5D 00 00 hex	2774h	0h
D373 Axis read (2)	**Pre val acc ramp selected:** The parameter shows the number of the active preset-reference-value-accelerating-ramp. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 04 5D 40 00 hex	2775h	0h
D374 Axis read (2)	**Pre val acc ramp value:** The parameter shows the value of the active preset-reference-value-accelerating-ramp. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 5D 80 00 hex	2776h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D375 Axis read (2)	**Pre val dec ramp selected:** The parameter shows the number of the selected preset-reference-value-decelerating-ramp. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 04 5D C0 00 hex	2777h	0h
D376 Axis read (2)	**Pre val dec ramp actual:** The parameter shows the number of the active preset-reference-value-decelerating-ramp. The decelerating ramp becomes active when the value of the current preset reference value is reached. The decelerating ramp of the last valid preset reference value is considered valid as long as this value has not yet been reached. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 04 5E 00 00 hex	2778h	0h
D377 Axis read (2)	**Ramp selected symmetrical:** The parameter indicates whether the active preset reference value is using symmetrical ramps for the clockwise and counterclockwise directions (**D21**.x). When the indication is *0:inactive*, different ramps are being used for the clockwise and counterclockwise directions. When the parameter is *1:active*, symmetrical ramps are being used. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 5E 40 00 hex	2779h	0h
D378 Axis read (2)	**Pre val dec ramp value:** The parameter shows the value of the active preset-reference-value-decelerating-ramp. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 5E 80 00 hex	277Ah	0h
D380 Axis read (2)	**Motorised pot reference:** The parameter shows the current value of the motorized pot reference value. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 5F 00 00 hex	277Ch	0h
D381 Axis read (2)	**Main ref value actual:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter shows the value of the active main reference value. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 5F 40 00 hex	277Dh	0h
D382 Axis read (2)	**Ref val after addition:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter shows the current value after addition of main reference value **D381** and additional reference value. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 5F 80 00 hex	277Eh	0h
D383 Axis read (2)	**Ref val after multiplying:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter shows the current reference value after multiplication of the factor reference value with the result of the addition of the main reference value and additional reference value (**D382**). **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 5F C0 00 hex	277Fh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D384 Axis read (2)	**Ref val after MasRef/Direction:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter shows the current reference value as per **D383**, the switchover to the master reference value (**D340**) and the direction signal (**D300**). **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 60 00 00 hex	2780h	0h
D385 Axis read (2)	**Ref val+highresolution ref val:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter indicates the current reference value after the addition of **D384** and the high-resolution reference value (**D331**). **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 60 40 00 hex	2781h	0h
D386 Axis read (2)	**Ref val after blocking/local:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter shows the current reference value **D385** after the stop signal, or jog reference value after direction blocking and limit switch and the switchover to local mode. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 60 80 00 hex	2782h	0h
D387 Axis read (2)	**Skipped ref value:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter shows the current reference value **D386** after direction skip. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 60 C0 00 hex	2783h	0h
D388 Axis read (2)	**Ref value after limiting:** The parameters **D381** to **D388** show the reference values within the reference value chain. The parameter shows the current reference value **D387** after deceleration control and the direction limitation **D338** and **D339**, and corresponds to the parameter **E06** (in rpm) after a possible inversion with **D57**. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 61 00 00 hex	2784h	0h
D389 Axis read (2)	**n-actual:** The parameter shows the currently filtered motor speed in torque control mode. When a switch is made from torque control to speed control, this value is frozen. This can be used in connection with the selection **D30** = 6: *n-actual* to retain the speed. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 61 40 00 hex	2785h	0h
D390 Axis read (2)	**Accelerating ramp actual:** The parameter shows the value of the active accelerating ramp based on the active reference value. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 61 80 00 hex	2786h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D391 Axis read (2)	**Decelerating ramp actual:** The parameter shows the value of the active decelerating ramp based on the active reference value. **NOTE** This parameter is indicated in user units per second. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.18; USS-Adr: 04 61 C0 00 hex	2787h	0h
D392 Axis read (2)	**Pos. torque limit actual:** The parameter shows the current, positive torque limit for external inputs (**C330** and **C331**). The current motor torque limit is indicated for the motor and generator torque limits (**C332** and **C333**). **NOTE** Other torque limits which further limit the torque specification such as **C03** or I^2t are not included in **D392**. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 62 00 00 hex	2788h	0h
D393 Axis read (2)	**Neg. torque limit actual:** The parameter shows the current, negative torque limit for external inputs (**C330** to **C331**). The current generator torque limit is indicated for the motor and generator torque limits (**C332** and **C333**). **NOTE** Other torque limits which further limit the torque specification such as **C03** or I^2t are not included in **D393**. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 62 40 00 hex	2789h	0h
D394 Axis read (2)	**Torque ref value actual:** The parameter shows the current value of the torque reference value as the sum of torque reference value for torque control and feed forward of the PID controller. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 62 80 00 hex	278Ah	0h
D395 Axis read (2)	**V limit at torque control actual:** The parameter shows the value of the current speed limit for torque control. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 04 62 C0 00 hex	278Bh	0h
D397 Axis read (2)	**Actual torque in user direction:** The parameter indicates the current motor torque (filtered) in the user direction (**E02** x **D57**). Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 04 63 40 00 hex	278Dh	0h
D398 Axis read (2)	**Actual speed in user direction:** The parameter shows the actual speed in the user direction (**E100** x **D57**). Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 04 63 80 00 hex	278Eh	0h
D399 Axis read (2)	**Act speed in machine units:** The parameter shows the actual speed. **NOTE** This parameter is shown in user units. The user units are specified in **D87** and **D88**. Fieldbus: 1LSB=siehe D86; PDO ; Type: I32; raw value:1LSB=Fnct.no.17; USS-Adr: 04 63 C0 00 hex	278Fh	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D400.0 Axis r=2, w=2	**Reverse delay:** When the signal *reverse delay* is to be processed with time delay, a switchon delay can be parameterized in **D400**.0 and a switchoff delay can be parameterized in **D400**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 00 00 hex	2790h Array	0h
D400.1 Axis r=2, w=2	**Reverse delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 00 01 hex	2790h Array	1h
D401.0 Axis r=2, w=2	**External fault delay:** When the signal *external fault delay* is to be processed with time delay, a switchon delay can be parameterized in **D401**.0 and a switchoff delay can be parameterized in **D401**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 40 00 hex	2791h Array	0h
D401.1 Axis r=2, w=2	**External fault delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 40 01 hex	2791h Array	1h
D402.0 Axis r=2, w=2	**Stop delay:** When the signal *stop delay* is to be processed with time delay, a switchon delay can be parameterized in **D402**.0 and a switchoff delay can be parameterized in **D402**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 80 00 hex	2792h Array	0h
D402.1 Axis r=2, w=2	**Stop delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 80 01 hex	2792h Array	1h
D403.0 Axis r=2, w=2	**Limit switch+ delay:** When the signal *limit switch+ delay* is to be processed with time delay, a switchon delay can be parameterized in **D403**.0 and a switchoff delay can be parameterized in **D403**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. Also please remember that the limit switches are evaluated high-active. For this reason, the delay for the limit switch switchoff (and thus the tripping) is parameterized in parameter element 0 and the switchon delay is parameterized in element 1. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 C0 00 hex	2793h Array	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D403.1 Axis r=2, w=2	**Limit switch+ delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 64 C0 01 hex	2793h Array	1h
D404.0 Axis r=2, w=2	**Limit switch- delay:** When the signal *limit switch- delay* is to be processed with time delay, a switchon delay can be parameterized in **D404**.0 and a switchoff delay can be parameterized in **D404**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 65 00 00 hex	2794h Array	0h
D404.1 Axis r=2, w=2	**Limit switch- delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 65 00 01 hex	2794h Array	1h
D405.0 Axis r=2, w=2	**Jog enable delay:** When the signal *jog enable delay* is to be processed with time delay, a switchon delay can be parameterized in **D405**.0 and a switchoff delay can be parameterized in **D405**.1. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 65 40 00 hex	2795h Array	0h
D405.1 Axis r=2, w=2	**Jog enable delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 65 40 01 hex	2795h Array	1h
D408.0 Axis r=2, w=2	**Pos. direction blocking delay:** When the signal *pos. direction blocking delay* is to be processed with time delay, a switchon delay can be parameterized in **D408**.0 and a switchoff delay can be parameterized in **D408**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 00 00 hex	2798h Array	0h
D408.1 Axis r=2, w=2	**Pos. direction blocking delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 00 01 hex	2798h Array	1h
D409.0 Axis r=2, w=2	**Neg. direction blocking delay:** When the signal *neg. direction blocking delay* is to be processed with time delay, a switchon delay can be parameterized in **D409**.0 and a switchoff delay can be parameterized in **D409**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 40 00 hex	2799h Array	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D409.1 Axis r=2, w=2	**Neg. direction blocking delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 40 01 hex	2799h Array	1h
D410.0 Axis r=2, w=2	**Torque switch delay:** When the signal *torque switch delay* is to be processed with time delay, a switchon delay can be parameterized in **D410**.0 and a switchoff delay can be parameterized in **D410**.1. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 80 00 hex	279Ah Array	0h
D410.1 Axis r=2, w=2	**Torque switch delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 80 01 hex	279Ah Array	1h
D411.0 Axis r=2, w=2	**Master / slave switch delay:** When the signal *master / slave switch delay* is to be processed with time delay, a switchon delay can be parameterized in **D411**.0 and a switchoff delay can be parameterized in **D411**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 C0 00 hex	279Bh Array	0h
D411.1 Axis r=2, w=2	**Master / slave switch delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 66 C0 01 hex	279Bh Array	1h
D412.0 Axis r=2, w=2	**Speed / torque switch delay:** When the signal *speed / torque switch delay* is to be processed with time delay, a switchon delay can be parameterized in **D412**.0 and a switchoff delay can be parameterized in **D412**.1. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 67 00 00 hex	279Ch Array	0h
D412.1 Axis r=2, w=2	**Speed / torque switch delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 67 00 01 hex	279Ch Array	1h
D413.0 Axis r=2, w=2	**Additional enable 2 delay:** When the signal *additional enable 2 delay* is to be processed with time delay, a switchon delay can be parameterized in **D413**.0 and a switchoff delay can be parameterized in **D413**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 67 40 00 hex	279Dh Array	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D413.1 Axis r=2, w=2	**Additional enable 2 delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 67 40 01 hex	279Dh Array	1h
D416.0 Axis r=2, w=2	**Motorised pot prest delay:** When the signal *motorised pot prest delay* is to be processed with time delay, a switchon delay can be parameterized in **D416**.0 and a switchoff delay can be parameterized in **D416**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 68 00 00 hex	27A0h Array	0h
D416.1 Axis r=2, w=2	**Motorised pot prest delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 68 00 01 hex	27A0h Array	1h
D417.0 Axis r=2, w=2	**Motorised pot ramp delay:** When the signal *motorised pot ramp delay* is to be processed with time delay, a switchon delay can be parameterized in **D417**.0 and a switchoff delay can be parameterized in **D417**.1. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 68 40 00 hex	27A1h Array	0h
D417.1 Axis r=2, w=2	**Motorized pot ramp delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 68 40 01 hex	27A1h Array	1h
D419.0 Axis r=2, w=2	**Edge enable main ref val delay:** When the signal *edge enable main ref val delay* is to be processed with time delay, a switchon delay can be parameterized in **D419**.0 and a switchoff delay can be parameterized in **D419**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 68 C0 00 hex	27A3h Array	0h
D419.1 Axis r=2, w=2	**Edge enable main ref val delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 68 C0 01 hex	27A3h Array	1h
D420.0 Axis r=2, w=2	**Level enable main ref val delay:** When the signal *level enable main ref val delay* is to be processed with time delay, a switchon delay can be parameterized in **D420**.0 and a switchoff delay can be parameterized in **D420**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 69 00 00 hex	27A4h Array	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D420.1 Axis r=2, w=2	**Level enable main ref val delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 69 00 01 hex	27A4h Array	1h
D428.0 Axis r=2, w=2	**Edge enable PR/FR delay:** When the signal *edge enable PR/FR delay* is to be processed with time delay, a switchon delay can be parameterized in **D428**.0 and a switchoff delay can be parameterized in **D428**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 6B 00 00 hex	27ACh Array	0h
D428.1 Axis r=2, w=2	**Edge enable PR/FR delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 6B 00 01 hex	27ACh Array	1h
D429.0 Axis r=2, w=2	**Level enable PR/FR delay:** When the signal *level enable PR/FR delay* is to be processed with time delay, a switchon delay can be parameterized in **D429**.0 and a switchoff delay can be parameterized in **D429**.1. The time is specified in ms. **NOTE** Remember that the delay time may be up to one inverter cycle longer (**A150**). This happens when the delay is in the range of the inverter cycle time **A150**. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 6B 40 00 hex	27ADh Array	0h
D429.1 Axis r=2, w=2	**Level enable PR/FR delay** *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 04 6B 40 01 hex	27ADh Array	1h
D430 Axis read (1)	**Actual val direction: D430** shows the direction which is specified at the end of the reference value path. Inversion of the motor direction by **D57** has no effect on **D430**. This is used here to indicate the direction in the user representation. The status bit is queried via fieldbus in **D201** Bit1. *0: positive;* *1: negative;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6B 80 00 hex	27AEh	0h
D431 Axis read (1)	**Brake open: D431** is *1:active* when the brake is open. The parameter becomes *0:inactive* when the brake begins to close. Die The status bit is queried via fieldbus in **D201** Bit2. **NOTE** The parameter is only written when **F08** > 0. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6B C0 00 hex	27AFh	0h
D432 Axis read (1)	**Brake closed: D432** is *1:active* when the brake is closed. The parameter becomes *0:inactive* when the brake begins to open. Die The status bit is queried via fieldbus in **D201** Bit3. **NOTE** The parameter is only written when **F08** > 0. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6C 00 00 hex	27B0h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D433 Axis read (1)	**Scan active:** When the level is high, the drive is in scan mode as per **C20**. In fieldbus mode the signal can be scanned in **D201** Bit4. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6C 40 00 hex	27B1h	0h
D434 Axis read (1)	**Heavy duty starting:** When the level is high, the drive is in heavy duty starting mode as per **C20**. In fieldbus mode the signal can be scanned in **D201** Bit5. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6C 80 00 hex	27B2h	0h
D435 Axis read (1)	**Ref value ready:** When the level is high, the inverter is enabled (**E48** = 4) and the brake is open. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6C C0 00 hex	27B3h	0h
D436 Axis read (1)	**Torque limit motoring / generating:** When the level is high, the torque limits are specified by motor and generator (i.e., the values of the sources set in **C132** and **C133** are values other than 0). In fieldbus mode the signal can be scanned in **D201** Bit7. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6D 00 00 hex	27B4h	0h
D437 Axis read (1)	**Jog active:** **D437** is *1:active* when the following conditions are fulfilled: - The jog enable (selector **D105**) or the jog reference value enable (**D55** and **D113** additional enable 2) is active. - A stop command (selector **D102**) is queued. - The speed has reached the range -**C40** to +**C40** once. The status bit is scanned via fieldbus in **D201** Bit8. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6D 40 00 hex	27B5h	0h
D438 Axis read (1)	**Stop active:** **D438** is *1:active* when a stop command is queued (selector **D102**) and the speed has reached the range -**C40** to +**C40** once. In fieldbus mode the signal can be scanned in **D201** Bit9. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6D 80 00 hex	27B6h	0h
D439 Axis read (1)	**Skip active:** When the level is high, the motor speed is located in the skipped area (**C10**.X, **C11**.X). In fieldbus mode the signal can be scanned in **D201** Bit10. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6D C0 00 hex	27B7h	0h
D440 Axis read (1)	**Positive torque active:** When the level is high, the current torque (**E90**) is greater than 5% in relation to the user direction (**D57**). Im In fieldbus mode the signal can be scanned in **D201** Bit11. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6E 00 00 hex	27B8h	0h
D441 Axis read (1)	**Negative torque active:** When the level is high, the current torque (**E90**) is less than -5% in relation to the user direction (**D57**). In fieldbus mode the signal can be scanned in **D201** Bit12. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6E 40 00 hex	27B9h	0h

D.. Reference Value			
Par.	**Description**	**Fieldbus-address**	
D442 Axis read (1)	**Forward direction:** When the level is high, the velocity (**E91**) is greater than **C40** in relation to the user direction (**D57**). In fieldbus mode the signal can be scanned in **D201** Bit13. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6E 80 00 hex	27BAh	0h
D443 Axis read (1)	**Accelerating:** When the level is high, the motor speed increases. In fieldbus mode the signal can be scanned in **D201** Bit14. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6E C0 00 hex	27BBh	0h
D444 Axis read (1)	**Decelerating:** When the level is high, the motor speed decreases. In fieldbus mode the signal can be scanned in **D201** Bit15. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 6F 00 00 hex	27BCh	0h
D445 Axis read (1)	**Torque control:** If parameter **D445** is *1:active*, the inverter is in torque control. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: B; USS-Adr: 04 6F 40 00 hex	27BDh	0h
D460 Axis read (1)	**Event A active:** When the level is high, the event queried via **D90** has occurred. In fieldbus mode the signal can be scanned in **D202** Bit11. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 73 00 00 hex	27CCh	0h
D461 Axis read (1)	**Event B active:** When the level is high, the event queried via **D91** has occurred. In fieldbus mode the signal can be scanned in **D202** Bit12. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 73 40 00 hex	27CDh	0h
D462 Axis read (1)	**Limit switch active:** When the level is high, one of the limit switches has tripped (**D303** or **D304**). In fieldbus mode the signal can be scanned in **D202** Bit13. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 73 80 00 hex	27CEh	0h
D463 Axis read (1)	**Warning active:** When the level is high, a warning has been determined (**E81** = 2). In fieldbus mode the signal can be scanned in **D202** Bit14. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 73 C0 00 hex	27CFh	0h
D464 Axis read (1)	**Switch on inhibit:** When the level is high, the inverter is in the device state "switch on inhibit" (**E48** = 1). Im Feldbusbetrieb kann das Signal in **D202** Bit 15 abgefragt werden. In fieldbus mode the signal can be scanned in **D202** Bi15. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 04 74 00 00 hex	27D0h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E00 Global read (0)	**I-Motor:** Indicates the current motor current as amount in amperes. Fieldbus: 1LSB=0,1A; PDO ; Type: I16; raw value:1LSB=Fnct.no.3; USS-Adr: 05 00 00 00 hex	2800h	0h
E01 Global read (0)	**P-Motor:** Indicates the current active power of the motor in kW. Fieldbus: 1LSB=0,001kW; PDO ; Type: I32; (raw value:2147483647 = 3435.973 kW); USS-Adr: 05 00 40 00 hex	2801h	0h
E02 Global read (0)	**M-Motor filtered:** Indication of the current motor torque in Nm. With asynchronous types of control as related to the nominal motor torque, with servo types of control as related to the standstill moment **M0**. Smoothed for indication on the device display. Access to unsmoothed amount is possible with **E90**. Fieldbus: 1LSB=0,1Nm; PDO ; Type: I16; raw value:1LSB=Fnct.no.7; USS-Adr: 05 00 80 00 hex	2802h	0h
E03 Global read (1)	**DC-link-voltage:** Indication of the current DC link voltage. Value range with single-phase inverters: 0 to 500 V, with three-phase inverters 0 to 800 V. Fieldbus: 1LSB=0,1V; PDO ; Type: I16; USS-Adr: 05 00 C0 00 hex	2803h	0h
E04 Global read (1)	**U-Motor:** Chained effective voltage present on the motor. Fieldbus: 1LSB=0,1V; PDO ; Type: I16; (raw value:32767 = 2317.0 V); USS-Adr: 05 01 00 00 hex	2804h	0h
E05 Global read (1)	**f1-Motor:** Frequency of the voltage applied to the motor. Fieldbus: 1LSB=0,1Hz; PDO ; Type: I32; (raw value:2147483647 = 512000.0 Hz); USS-Adr: 05 01 40 00 hex	2805h	0h
E06 Global read (0)	**n-reference:** With speed operation. Indication of the current speed reference value as related to the motor shaft. Fieldbus: 1LSB=0,1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 05 01 80 00 hex	2806h	0h
E07 Global read (1)	**n-post-ramp:** Indication of the current speed as related to the motor shaft after the ramp generator and the n-reference value lowpass. In operating mode position (**C62**=1), the sum of output position control and n-forwardfeed (= speed control reference value) is indicated. Fieldbus: 1LSB=0,1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 05 01 C0 00 hex	2807h	0h
E08 Global read (0)	**n-motor filtered:** Indication of the current motor speed. Smoothed for indication on the device display. Access to the unsmoothed motor speed is possible with **E91**. When the drive is operated without feedback, this speed is determined mathematically via the motor model (in this case, the actual motor speed may differ from the calculated speed). Fieldbus: 1LSB=1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 05 02 00 00 hex	2808h	0h
E09 Global read (0)	**Rotor position:** Position of the motor shaft and the motor encoder respectively. With absolute value encoders, the encoder position is continuously read from the encoder and entered in this parameter. The value range is limited to ±128 U. This position is available for all operating modes. With types of control without motor encoders, **E09** is simulated (not precise). The display shows whole motor revolutions with 3 positions after the decimal point. The full resolution of 24 B bit/U is supplied via fieldbus. Accuracy and maximum value range varies with the encoder. When **E09** is evaluated by a higher-level controller for position acquisition, the following must be true: • The encoder increment number must be an even power of two. • **E09** must be read cyclically • The position must be accumulated on the controller. Fieldbus: 1LSB=0,001revolutions; PDO ; Type: I32; (raw value:24 Bit=1·revolutions); USS-Adr: 05 02 40 00 hex	2809h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E10 Global read (1)	**AE1-Level:** Level of the signal available on analog input 1 (X100.1 - X100.3) (without consideration of **F11**, **F12**). To compensate for an offset (the value which arrives at the inverter when the controller specifies 0 V), this must be entered with the opposite sign in **F11**. Fieldbus: 1LSB=0,001V; PDO ; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 05 02 80 00 hex	280Ah	0h
E11 Global read (1)	**AE2-Level:** Level of the signal on analog input 2 (X100.4 - X100.5) (without consideration of **F21**, **F22**). To compensate for an offset (the value which arrives at the inverter when the controller specifies 0 V), this must be entered in **F21** with the opposite sign. Fieldbus: 1LSB=0,001V; PDO ; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 05 02 C0 00 hex	280Bh	0h
E14 Global read (2)	**Chargerelay:** Status of the internal charging relay. Active means that the relay contact is closed and the charging resistors from the power network to the DC link are bypassed. When the network voltage is turned on, the charging relay remains open at first. It closes when the DC link is charged up via the charging resistors. **NOTE** Make sure that the charging relay contacts are open (**E14** = *0:inactive*) before you connect the power supply. Particularly in a DC link network, remember that the charging relays of all connected inverters are open before the power supply is connected. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 05 03 80 00 hex	280Eh	0h
E15 Global read (1)	**n-motor-encoder:** Speed calculated from the motor encoder specified in **B26**. This indication also functions when the control type in **B20** does not require an encoder. Fieldbus: 1LSB=0,1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 05 03 C0 00 hex	280Fh	0h
E16 Global read (1)	**Analog-output1-level:** Indication of the level on the analog output (X100.6 und X100.7). ±10 V corresponds to ±100 %. Fieldbus: 1LSB=0,001V; PDO ; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 05 04 00 00 hex	2810h	0h
E17 Global read (1)	**Relay1:** State of relay 1 (ready-for-operation relay, X1.1, X1.2). Active means that the relay contact is closed. Indicates readiness for operation of the control electronics. There are no faults. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: B; USS-Adr: 05 04 40 00 hex	2811h	0h
E18 Global read (1)	**Relay 2:** State of relay 2 (mechanical halting brake, X2.1, X2.2). Active means that the relay contact is closed and the halting brake is open. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: B; USS-Adr: 05 04 80 00 hex	2812h	0h
E19 Global read (2)	**Binary inputs:** Indicates status of all binary inputs as binary word. Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 05 04 C0 00 hex	2813h	0h
E20 Global read (1)	**Device utilisation:** Indicates the current utilization of the inverter in %. 100% corresponds to the nominal power of the inverter. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 05 00 00 hex	2814h	0h
E21 Global read (1)	**Motor utilisation:** Indicates current utilization of the motor in %. Reference number is the nominal motor current entered under **B12**. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 05 40 00 hex	2815h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E22 Global read (1)	**i2t-device:** Level of the thermal device model (i^2t model). The fault "*59:Overtemp.device i2t*" occurs at 105% of full load. When the 100% limit is reached, the inverter triggers the event "*39:Overtemp.device i2t*" with the level specified in **U02**. The output current is limited to the permissible device nominal current for servo and vector control (**B20**=2 or 64). *Value range in %: 0 ... 80 ... 255* Fieldbus: 1LSB=1%; PDO ; Type: U8; (raw value:100·LSB=100%); USS-Adr: 05 05 80 00 hex	2816h	0h
E23 Axis read (1)	**i2t-motor:** Level of the thermal motor model (i^2t model). 100% corresponds to full utilization. The thermal model is based on the design data entered under group **B..** (Motor) (i.e., continuous operation - S1 operation). With more than 100%, the reaction parameterized in **U10**, **U11** is triggered for the event "*45:Overtemp.device i2t*." *Value range in %: 0 ... 80 ... 255* Fieldbus: 1LSB=1%; PDO ; Type: U8; (raw value:100·LSB=100%); USS-Adr: 05 05 C0 00 hex	2817h	0h
E24 Global read (1)	**i2t-braking resistor:** Level of the thermal braking resistor model (i^2t model). 100% corresponds to full utilization. The data of the braking resistor are specified with **A21** ... **A23**. With more than 100%, the fault "*42:TempBrakeRes" occurs.* *Value range in %: 0 ... 80 ... 255* Fieldbus: 1LSB=1%; PDO ; Type: U8; (raw value:100·LSB=100%); USS-Adr: 05 06 00 00 hex	2818h	0h
E25 Global read (1)	**Device-temperature:** Current device temperature in °C. Fieldbus: 1LSB=1°C; PDO ; Type: I16; (raw value:32767 = 328 °C); USS-Adr: 05 06 40 00 hex	2819h	0h
E27 Global read (2)	**Binary outputs:** The status of all binary outputs is indicated as binary word. Bit0=BA1 to Bit9=BA10. **NOTE** Note that an encoder simulation on BA1 and BA2 is not indicated in **E27**. Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 05 06 C0 00 hex	281Bh	0h
E28 Global read (1)	**Analog-output2-level:** Indication of the level on the analog output (X1.7 and X1.8). ±10 V corresponds to ±100 %. Fieldbus: 1LSB=0,001V; PDO ; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 05 07 00 00 hex	281Ch	0h
E30 Global read (1)	**Run time:** Indication of how long the inverter controller section was supplied with voltage (operating hours counter). Fieldbus: 1LSB=1; Type: U32; USS-Adr: 05 07 80 00 hex	281Eh	0h
E31 Global read (1)	**Enable time:** Indication of how long the inverter controller section was supplied with voltage and the power section enable was active. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 05 07 C0 00 hex	281Fh	0h
E32 Global read (1)	**Energy counter:** Indication of the total supplied energy in Wh. Fieldbus: 1LSB=1Wh; PDO ; Type: U32; USS-Adr: 05 08 00 00 hex	2820h	0h
E33 Global read (1)	**Vi-max-memorized value:** The DC link voltage is monitored continuously. The greatest measured value is stored here non-volatilely. This value can be reset with **A37**→1. Fieldbus: 1LSB=0,1V; PDO ; Type: I16; USS-Adr: 05 08 40 00 hex	2821h	0h
E34 Global read (1)	**I-max-memorized value:** The motor current is monitored continuously. The greatest measured value is stored here non-volatilely. This value can be reset with **A37**→1. Fieldbus: 1LSB=0,1A; PDO ; Type: I16; raw value:1LSB=Fnct.no.3; USS-Adr: 05 08 80 00 hex	2822h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E35 Global read (1)	**Tmin-memorized value:** The temperature of the inverter is monitored continuously. The smallest measured value is stored here non-volatilely. This value can be reset with **A37**→1. Fieldbus: 1LSB=1°C; PDO ; Type: I16; (raw value:32767 = 328 °C); USS-Adr: 05 08 C0 00 hex	2823h	0h
E36 Global read (1)	**Tmax-memorized value:** The temperature of the inverter is monitored continuously. The greatest measured value is stored here non-volatilely. This value can be reset with **A37**→1. Fieldbus: 1LSB=1°C; PDO ; Type: I16; (raw value:32767 = 328 °C); USS-Adr: 05 09 00 00 hex	2824h	0h
E39 Global read (3)	**Application start time:** When the configuration has started successfully on the device, **E30** operating time is copied to **E39**. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 05 09 C0 00 hex	2827h	0h
E40 Global r=3, w=4	**Temperature counter:** This parameter shows the time in % during which the inverter was operated above a device temperature of 75°C (as measured by the device sensor). The maximum permissible time is 1 hour (= 100%) within an operating time of 24 hours. The counter counts up by 0.1% in 3.6 sec and down by 0.1% in 83 sec (i.e., 23 times slower). Fieldbus: 1LSB=0,1%; Type: U32; (raw value:4294967295·LSB=1327914,6%); USS-Adr: 05 0A 00 00 hex	2828h	0h
E43 Global read (3)	**Event cause:** Diagnostic information concerning the fault which occurred last. Event "*34:Hardware fault*" 1: Fault while loading the FPGA block to the control section. 2: The non-volatile memory of the control section board is defective. 3: The non-volatile memory of the power section board is defective. 10: The power section serial number does not match the request in control section. 11: Deviation in current offset measurement during device startup is too great. Event "*37:n-feedback*" 1: Para <-> encoder; parameterization does not match the connected encoder. 2: ParaChgOffOn; *Parameterchange;* encoder parameterization cannot be changed during operation. Save and then turn device off and on so that the change takes effect. 4: Chan.A/Clk; wire break, track A / clock 5: Chan.B/Dat; wire break, track B / data 6: Chan.0; wire break, track 0 7: EnDatAlarm; The EnDat® encoder reported an alarm. 8: EnDatCRC; The EnDat® encoder reported that too many errors were found during the redundancy check. The cause can be wirebreak or errors in the cable shield. 9: Comm. offset; commutating offset is not correct. 10: Resol.carrier; resolver is not or wrong connected, wirebreak is possible 11: Resol.undervolt.; wrong transmission factor 12: Resol.overvolt.; wrong transmission factor 13: Resol.parameter; 14: Resol.failure; wirebreak 15: X120-double tr.; Different values were determined during the double transmission to X120. 16: X120-Busy; encoder gave no response for too long; For SSI slave: No telegram for the last 5 ms and drive is enabled. 17: X120-wirebreak; 18: X120-Timeout; 19: X4-double tr.; Different values were determined during the double transmission to X4. 20: X4-Busy; encoder gave no response for too long 21: X4-wirebreak; 22: AX5000; Acknowledgment of the axis switch is not effected. 23: Ax5000required; comparison of E57 and E70. 24: X120-speed; **B297**, **G297** or **I297** exceeded. 25: X4-speed; **B297**, **G297** or **I297** exceeded. 26: No Enc. found; either no encoder was found on X4 or the EnDat®/SSI encoder has a wire break. 27: AX5000 found; a functional AX 5000 option board was found on X4 although incremental encoder or EnDat® encoder was parameterized, or no EnDat® encoder is connected to the AX 5000 option board. 28: EnDat found.; an EnDat® encoder was found on X4 although another encoder was parameterized.	282Bh	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
	29: AX5000/IncEnc; either X4 has a faulty AX 5000 option board or the A-track of an incremental encoder has a wire break. 30: Opt2 incomp.; Version of option 2 is not current. Event "*40:invalid data*" 0 ... 7: Fault on the non-volatile memory of the control section board. 1: Low-level write/read error or timeout 2: Unknown data block. 3: Block has no data security 4: Data block has checksum error. 5: Data block is "read only." 6: Startup phase: block read error 7: Block not found. 16 ... 31: Non-volatile power module memory 17: Low-level write/read error or timeout 18: Unknown data block. 19: Block has no data security 20: Data block has checksum error. 21: Data block is "read only." 38: Startup phase: block read error 23: Block not found. 32 ... 47: Non-volatile encoder memory 32: No nameplate data exists 33: A parameter from the electrical motor nameplate could not be entered (limit value or non existent). 48 bis 59: Non-volatile option 2 memory 48: Error in non-volatile memory of option 2 with REA 5000 and XEA 5000 and XEA 5001 respectively Event "*46: low voltage*" 1: Low Voltage; the value in **E03** DC-link-voltage has dropped below the value parameterized in **A35** low voltage limit. 2: Network phase; phase monitoring has found that a switched-on power unit is missing a phase. 3: Drop in network; when phase monitoring finds that the network voltage is missing, the charging relay is immediately switched off. Normal operation is maintained. If the power unit is still switched on after network voltage returns, a fault is triggered after 0.5 s. Event "*52:communication*" 1: CAN LifeGuard; recognized the "life-guarding-event" (master no longer sends RTR). 2: CAN Sync Error; the sync message was not received within the time set in parameter **A201** Cycle Period Timeout. 3: CAN Bus Off; went off when bus went off. The driver started it again. 4: PZD-Timeout; failure of the cyclic data connection (PROFIBUS). 5: USS; (under preparation) failure of the cyclic data connection (USS). 6: Systembus; (under preparation) Event "*55:Option board*" 1: CAN 5000 failure; CAN 5000 was recognized , installed and failed. 2: DP 5000 failure; DP 5000 was recognized, installed and failed. 3: REA 5000 failure; REA 5000 was recognized, installed and failed. 4: SEA 5000 failure; SEA 5000 was recognized, installed and failed. 5: XEA 5000 failure; XEA 5000 or XEA 5001 was recognized, installed and failed. 6: EncSim-init; could not be initialized on XEA. The motor may have turned during initialization. 7: WrongOption; wrong or nonexisting option board (compar. E54/E58 with E68/E69) 8: LEA 5000 failure; LEA 5000 was recognized, installed and failed. 9: ECS 5000 failure; ECS 5000 was recognized, installed and failed. 10: 24V failure; Failure of the 24 V supply for XEA 5001 or LEA 5000. 11: SEA 5001 failure; SEA 5001 was recognized, installed and failed. Event "*57:Runtime usage*" Cause is the number of the affected task. Event "*69:Motor connection*" 1: Contactor is stuck. With multiple-axis operation with POSISwitch®, it was determined during axis switching or initial startup that current could flow although all contactors were supposed to have broken contact. 2: No motor. Despite high output voltage and low speed, no current could be measured. A contactor may have broken contact.		

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
	Event "*70:Parameter consistency*" 1: no servoencoder; control mode **B20** is set to "servo" but no appropriate encoder is selected (**B26**, **H..** parameter). 2: X120 direction; X120 is used as source in one parameter but is parameterized in **H120** as drain (or vice versa). 3: B12<->B20; Control mode **B20** is not set to servo but the nominal motor current (**B12**) exceeds the 4-kHz nominal current (**R24**) of the device by more than 1.5 times. 4: B10<->H31; Resolver/motorpoleno.; the set motor pole number (**B10**) and the resolver pole number (**H31**) do not match. 5: Neg. slip. With use of control modes V/f, SLVE or Vector Control (**B20**): Control mode to "ASM": A negative slip results from the values for nominal motor speed (**B13**), nominal motor frequency (**B15**) and motor pole number (**B10**). 7: B26:SSI-Slave; SSI slave may not be used as motor encoder (synchronization problems) 8: C01>B83; **C01** may not be greater than **B83**. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 0A C0 00 hex		
E44 Global read (0)	**Event cause:** Diagnostic information for the fault which occurred last. Indication of the cause in plain text. Fieldbus: Type: Str16; USS-Adr: 05 0B 00 00 hex	282Ch	0h
E48 Global read (0)	**Device control state:** State of the device state machine. The device state machine enables or disables the drive function and the power module (application on the active axis). *0: Self-test;* The inverter is executing a self test and calibration procedure and cannot be enabled yet. The drive function is disabled. The device state automatically changes after a short time to *1:Switch on inhibit*. *1: Switch-on disable;* This device state prevents an automatic restart during device startup and with the fault acknowledgment. The drive function is disabled. The device state can change to *2:Ready for switch-on* when - The startup disable ASP5000 permits operation (**E67**Starting lockout = *0:inactive*) - The DC link is charged via the charging circuit - The enable is inactive - A possible axis switch is finished **NOTE** Remember that the change in device status from *1:Switch on inhibit* to *2:Ready for switch-on* depends on parameter **A34**. *2: Ready for switch-on;* The DC link is charged; **E67**Starting lockout is inactive; any possible axis switch is finished. The drive function is disabled. If the enable becomes active now, the device state changes to *3:Switched on*. *3: Switched on;* The DC link is charged; **E67**Starting lockout is inactive; the power module is being prepared for operation. The drive function is disabled. The device state changes to *4:Enabled* after the longer of the two times 4 msec or **A150** cycle time. *4: Enabled;* The drive function is enabled. Reference values are processed. *5: Fault;* A fault has occurred. The fault memory was written. The drive function is disabled. The device state can changed to *1:Switch on inhibit* when the fault is acknowledged. **NOTE** Remember that the change in device state from *1:Switch on inhibit* to *2: Ready for switch-on* depends on parameter **A34**. *6: Fault reaction;* A fault has occurred. The fault memory is being written. When **A29** fault-quick stop occurs, the drive function remains enabled for the time of the quick stop. The device state changes to *5:Fault* when - The fault memory is written AND either - The power module must be switched off (e.g., for short circuit or ground fault) - **A67** Start up inhibit becomes = 1:active or - **A29** Fault quick stop is = *0:inactive* or - The quick stop ends (in standstill after maximum **A39** t-max Q-Stop or with enable = inactive) or - When **E06** DC-link-voltage becomes less than 130 V. *7: Quick stop;* A quick stop was triggered; the inverter moves with the quick stop ramp, speed-controlled, to a standstill. The drive function remains enabled for the time of the quick stop. After the quick stop is concluded, the device state changes (depending on the device control in the global area, **A39** t-max. Q-stop, **A44** enablequick-stop, **A45** quick stop end). Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 0C 00 00 hex	2830h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E50 Global read (0)	**Device:** Indication of the device type (e.g., MDS 5015). Fieldbus: Type: Str16; USS-Adr: 05 0C 80 00 hex	2832h	0h
E51 Global read (0)	**Software version:** Software version of the inverter (e.g., V5.0). Fieldbus: Type: Str16; USS-Adr: 05 0C C0 00 hex	2833h	0h
E52 Global read (1)	**Device number:** Number of the device from a manufactured series. Corresponds to the number on the nameplate. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 05 0D 00 00 hex	2834h	0h
E53 Global r=1, w=4	**Configuration identification global:** Indicates the abbreviation for the configuration of the global area (independent of axis). If the configuration was changed, an asterisk (*) appears. *Default setting: 5:CANopen* Fieldbus: Type: Str16; USS-Adr: 05 0D 40 00 hex	2835h	0h
E54 Global read (1)	**Option board 1:** Indication of the upper option board (e.g., CAN 5000) which was detected during initialization. Fieldbus: Type: Str16; USS-Adr: 05 0D 80 00 hex	2836h	0h
E55 Axis r=1, w=4	**Configuration identification axis:** Indicates the abbreviation for the configuration of the axis. If the configuration was changed, an asterisk (*) appears. *Default setting: 18:ComfortRV* Fieldbus: Type: Str16; USS-Adr: 05 0D C0 00 hex	2837h	0h
E56.0 Global r=1, w=2	**Parameter identification:** Indicates whether parameters of the axis 1 were changed via the operator panel (display and keys). When *"0:Axis 1"* is selected in **A11** Axis Edit and at least one parameter was changed via the operator panel, the value of **E56**.0 Parameter identification is set to 255. When*"1:Axis 2"* is selected in **A11**, the value of **E56**.1 is set to 255 if changes were made. The same also applies to axis 3 and 4. This can be used as an indication of unauthorized manipulation of parameters. 1: Default setting of POSITool. 2..254: Value was purposely set by the user in POSITool or fieldbus and has not been changed yet. 255: At least one value was changed via the operator panel! Exceptions: When **A11** is set on the operator panel or **A00** Save values is triggered, this has no effect on **E56**. *Value range: 0 ... 1 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 05 0E 00 00 hex	2838h Array	0h
E56.1 Global r=1, w=2	**Parameter identification:** Indicates whether parameters of the axis 2 were changed via the operator panel (display and keys). When *"0:Axis 1"* is selected in **A11** Axis Edit and at least one parameter was changed via the operator panel, the value of **E56**.0 Parameter identification is set to 255. When*"1:Axis 2"* is selected in **A11**, the value of **E56**.1 is set to 255 if changes were made. The same also applies to axis 3 and 4. This can be used as an indication of unauthorized manipulation of parameters. 1: Default setting of POSITool. 2..254: Value was purposely set by the user in POSITool or fieldbus and has not been changed yet. 255: At least one value was changed via the operator panel! Exceptions: When **A11** is set on the operator panel or **A00** Save values is triggered, this has no effect on **E56**. *Value range: 0 ... 1 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 05 0E 00 01 hex	2838h Array	1h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E56.2 Global r=1, w=2	**Parameter identification:** Indicates whether parameters of the axis 3 were changed via the operator panel (display and keys). When *"0:Axis 1"* is selected in **A11** Axis Edit and at least one parameter was changed via the operator panel, the value of **E56**.0 Parameter identification is set to 255. When*"1:Axis 2"* is selected in **A11**, the value of **E56**.1 is set to 255 if changes were made. The same also applies to axis 3 and 4. This can be used as an indication of unauthorized manipulation of parameters. 1: Default setting of POSITool. 2..254: Value was purposely set by the user in POSITool or fieldbus and has not been changed yet. 255: At least one value was changed via the operator panel! Exceptions: When **A11** is set on the operator panel or **A00** Save values is triggered, this has no effect on **E56**. *Value range: 0 ... 1 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 05 0E 00 02 hex	2838h Array	2h
E56.3 Global r=1, w=2	**Parameter identification:** Indicates whether parameters of the axis 4 were changed via the operator panel (display and keys). When *"0:Axis 1"* is selected in **A11** Axis Edit and at least one parameter was changed via the operator panel, the value of **E56**.0 Parameter identification is set to 255. When*"1:Axis 2"* is selected in **A11**, the value of **E56**.1 is set to 255 if changes were made. The same also applies to axis 3 and 4. This can be used as an indication of unauthorized manipulation of parameters. 1: Default setting of POSITool. 2..254: Value was purposely set by the user in POSITool or fieldbus and has not been changed yet. 255: At least one value was changed via the operator panel! Exceptions: When **A11** is set on the operator panel or **A00** Save values is triggered, this has no effect on **E56**. *Value range: 0 ... 1 ... 255* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 05 0E 00 03 hex	2838h Array	3h
E57 Global read (1)	**POSISwitch:** Indication of a POSISwitch® which was detected during initialization. Fieldbus: Type: Str16; USS-Adr: 05 0E 40 00 hex	2839h	0h
E58 Global read (1)	**Optional board 2:** Indication of the lower option board (e.g., SEA 5000) which was detected during initialization. Fieldbus: Type: Str16; USS-Adr: 05 0E 80 00 hex	283Ah	0h
E59 Global r=1, w=4	**Configuration identification:** Indicates the abbreviation for the complete configuration (global area and all four axes). If the configuration was changed, an asterisk (*) is shown. *Default setting: user* Fieldbus: Type: Str16; USS-Adr: 05 0E C0 00 hex	283Bh	0h
E62 Global read (1)	**Act. pos. T-max:** Currently effective positive torque limit in relation to **B18**. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 0F 80 00 hex	283Eh	0h
E66 Global read (1)	**Act. neg. T-max:** Currently effective positive torque limit in relation to **B18**. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 10 80 00 hex	2842h	0h
E67 Global read (1)	**Starting lockout:** Indication of the state of the startup-disable option. *0: inactive;* The starting lockout (startup disable) is inactive. The power section can be enabled. *1: active;* The starting lockout (startup disable) is active. The power section is reliably disabled. Fieldbus: 1LSB=1; PDO ; Type: B; USS-Adr: 05 10 C0 00 hex	2843h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E68 Global read (3)	**Required optional board 1:** Is entered by the POSITool configuration assistant. When the configuration is transferred via Paramodul to another device, a comparison of **E68** and **E54** ensures that all hardware resources are present. If not, the fault *"55:option board"* is triggered with **E43** event cause =7:wrong or missing option board . The fault can then not be acknowledged. *Default setting: CAN 5000* Fieldbus: Type: Str16; USS-Adr: 05 11 00 00 hex	2844h	0h
E69 Global read (3)	**Required optional board 2:** Is entered by the POSITool configuration assistant. When the configuration is transferred via Paramodul to another device, a comparison of **E69** and **E58** ensures that all hardware resources are present. If not, the fault *"55:option board"* is triggered with **E43** event cause =7:wrong or missing option board . The fault can then not be acknowledged. *Default setting: SEA 5001* Fieldbus: Type: Str16; USS-Adr: 05 11 40 00 hex	2845h	0h
E70 Global read (3)	**Required Ax5000:** Is entered by the POSITool configuration assistant. When the configuration via Paramodul is transferred to another device, a comparison of **E70** with **E57** ensures that all hardware resources are present. If not, the fault *"37:n-feedback"* (from V5.2: 37:encoder) with **E43** event cause=*23:Ax5000-n-reference* is triggered. The fault can then not be acknowledged. *Default setting: AX 5000* Fieldbus: Type: Str16; USS-Adr: 05 11 80 00 hex	2846h	0h
E71 Global read (1)	**AE1 scale:** AE1 signal by offset and gain. **E71** = (**E10** + **F11**) * **F12**. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 05 11 C0 00 hex	2847h	0h
E72 Global read (1)	**AE2 scale:** AE2 signal by filter, offset and gain. **E72** = (**E11** + **F21**) * **F22**. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 05 12 00 00 hex	2848h	0h
E73 Global read (1)	**AE3 scale:** AE2 signal by filter, offset and gain as well as PID controller and offset 2. **E73** = (**E74** + **F31**) * **F32** Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 05 12 40 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2849h	0h
E74 Global read (1)	**AE3-Level:** Level of signal queued on the analog input 3 (X102.1 - X102.2) (without consideration of **F31**, **F32**). To allow for an offset (the value which arrives at the inverter when the controller specifies 0 V), this must be entered in **F31** with the opposite sign. Fieldbus: 1LSB=0,001V; PDO ; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 05 12 80 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	284Ah	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E80 Axis read (0)	**Operating condition:** Indication of the current operating status as per the operating indication. Useful for fieldbus queries or serial remote control. *10: PLCO_Init;* *11: PLCO_Passive;* *12: standstill;* *13: discrete motion;* *14: continuous motion;* *15: synchronous motion;* *16: stopping;* *17: error stop;* *18: homing;* *19: limit switch;* *20: denied;* *21: limited;* *22: aborted;* *23: waiting;* *24: delay;* *30: fault;* *31: self-test;* *32: switch-on disable;* *33: parametrization lock;* *34: quick stop;* *35: switched on;* *36: jog active;* *37: Stop activ;* *38: stop;* *39: not allowed direction;* *40: capturing;* *41: load start;* *42: accelerating;* *43: decelerating;* *44: reference > max reference;* *45: reference < min reference;* *46: zero torque;* *47: negative Torque;* *48: positive Torque;* *49: standstill;* *50: forward direction;* *51: backward direction;* *52: limit switch wrong;* Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 14 00 00 hex	2850h	0h
E81 Global read (1)	**Event level:** Indicates whether a current event is queued. The corresponding event type is indicated in **E82**. Useful for fieldbus polling or serial remote control. *0: inactive;* The event system is inactive. The inverter is in normal operation. *1: Message;* A message is queued. Operation continues. *2: Warning;* A warning is queued. Operation can be continued until expiration of this event's warning time (indicated in **E83** warning time). Afterwards a fault is triggered. *3: Fault;* A fault has occurred. Drive function is disabled. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 14 40 00 hex	2851h	0h
E82 Global read (0)	**Event type:** Indication of the currently queued event/fault. Useful for fieldbus polling or serial remote control. The cause is stored in **E43 / E44**. *30: inactive;* *31: Short/ground;* The hardware overcurrent switch off is active because the motor demands too much current from the inverter (interwinding fault, overload). *32: Short/ground internal;* During the enabling of the inverter, a short circuit was determined. An internal device error has probably occurred. *33: Overcurrent;* The total motor current exceeds the permissible maximum. Could be acceleration times are too short or torque limits in **C03** and **C05** were set incorrectly. *34: Hardware fault;* A hardware error has occurred (e.g., in the memory of the control section). See **E43**.	2852h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
	35: Watchdog; The watchdog of the microprocessor has triggered. The microprocessor is being used to full capacity or its function may be faulty. *36: High voltage;* The voltage in the DC link exceeds the permissible maximum. This can be due to excessive network voltage, the feedback of the drive during braking mode, too low a braking resistor or due to a brake ramp which is too steep. *37: Encoder;* An error in the parameterized encoder was determined (for details, see **E43**). *38: Overtemp.device sensor;* The temperature measured by the device sensor exceeds the permissible maximum value. The cause may be that ambient and switching cabinet temperatures are too high. *39: Overtemp.device i2t;* The i2t-model for the inverter exceeds 100% of the thermal capacity. Causes may be an inverter overload due to a motor blockage or a switching frequency which is too high. *40: Invalid data;* While the non-volatile memory was being initialized, a data error was found (for details, see **E43**). *41: Temp.MotorTMP;* The motor temperature sensor reports excessive temperature. The motor may be overloaded or the temperature sensor is not connected. *42: TempBrakeRes.;* The i2t model for the braking resistor exceeds 100% of the capacity. The braking resistor may not be designed to handle the application. *43: inactive;* *44: External fault 1;* Triggering is programmed application-specifically. *45: Overtemp.motor i2t;* The i2t model of the motor reaches 100& of the load. The motor may be overloaded. *46: Low voltage;* The DC link voltage is below the limit value set in **A35**. The cause can be drops in the network voltage, the failure of a phase with three-phase connection or the acceleration times are too short. *47: Torque limit;* The torque permitted for static operation is exceeded in the controller types servo controller, vector controller or sensorless vector controller. The limits may have been set incorrectly in **C03** and **C05**. *48: inactive;* *49: inactive;* *50: inactive;* *51: inactive;* *52: Communication;* A fault in communication was determined (for details, see **E43**). *53: inactive;* *54: inactive;* *55: Option board;* A fault in the operation of an option board was determined (for details, see **E43**). *56: Overspeed;* The measured speed was greater than **C01** x 1.1 + 100 Rpm. The encoder may be defective. *57: Second activation;* The cycle time of a real-time task was exceeded (for details, see **E43**). *58: Grounded;* The power module has determined an error (starting with module 3). *59: Overtemp.device i2t;* The i2t model of the inverter exceeds 105% of the capacity. The cause may be an overload of the inverter due to a motor blockage or a switching frequency which is too high. *60: <u102>;* *61: <u112>;* *62: <u122>;* *63: <u132>;* *64: <u142>;* *65: <u152>;* *66: <u162>;* *67: <u172>;* *68: External fault 2;* Triggering is programmed application-specifically. *69: Motor connection;* A connection error of the motor was determined (for details, see **E43**). *70: Parameter consistency;* The parameterization has inconsistencies (for details, see **E43**). Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 14 80 00 hex		
E83 Global read (1)	**Warning time:** While warnings are running, the time remaining until the fault is triggered is indicated. Useful for fieldbus polling or serial remote control. Fieldbus: 1LSB=1s; PDO ; Type: U8; USS-Adr: 05 14 C0 00 hex	2853h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E84 Global read (1)	**Active axis:** Indication of the current axis. Useful for fieldbus polling or serial remote control. *0: Axis 1;* *1: Axis 2;* *2: Axis 3;* *3: Axis 4;* *4: inactive;* *5: inactive;* *6: inactive;* *7: inactive;* Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 15 00 00 hex	2854h	0h
E90 Global read (3)	**M-Motor:** Indication of the current motor torque in Nm. In contrast to **E02**, not smoothed. Fieldbus: 1LSB=0,01Nm; PDO ; Type: I16; raw value:1LSB=Fnct.no.16; USS-Adr: 05 16 80 00 hex	285Ah	0h
E91 Global read (3)	**n-motor:** Indication of the current motor speed in Rpm. In contrast to **E08**, not smoothed. When the drive is operated without feedback, this speed is mathematically determined via the motor model (in this case, the actual motor speed may differ from the calculated speed). Fieldbus: 1LSB=0,1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 05 16 C0 00 hex	285Bh	0h
E92 Global read (3)	**I-d:** Flux current in %. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 17 00 00 hex	285Ch	0h
E93 Global read (3)	**I-q:** Torque-generating current in %. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 17 40 00 hex	285Dh	0h
E94 Global read (3)	**I-a:** Measured a-current components in ab-system. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 17 80 00 hex	285Eh	0h
E95 Global read (3)	**I-b:** Measured b-current components in ab-system. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 17 C0 00 hex	285Fh	0h
E96 Global read (3)	**I-u:** Measured u-current components in uvw-system. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 18 00 00 hex	2860h	0h
E97 Global read (3)	**I-v:** Measured v-current component in uvw-sysstem. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 18 40 00 hex	2861h	0h
E98 Global read (3)	**Ud:** Voltage in d-direction in V (chained peak voltage). Fieldbus: 1LSB=0,1V; Type: I16; USS-Adr: 05 18 80 00 hex	2862h	0h
E99 Global read (3)	**Uq:** Voltage in q-direction in V (chained peak voltage). Fieldbus: 1LSB=0,1V; Type: I16; USS-Adr: 05 18 C0 00 hex	2863h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E100 Global read (1)	**n-motor:** Indication of the current motor speed as % in space-saving 16-bit format. The specification is related to **C01** n-max. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 05 19 00 00 hex	2864h	0h
E101 Global read (1)	**I-Motor:** Indicates the current motor current in % of the nominal device current at 4 kHz switching frequency. Fieldbus: 1LSB=1%; PDO ; Type: U8; USS-Adr: 05 19 40 00 hex	2865h	0h
E120 Global read (1)	**Equipment:** The text entered in the field "equipment" during step 1/6 of the device configuration. Fieldbus: Type: Str8; USS-Adr: 05 1E 00 00 hex	2878h	0h
E121 Global read (1)	**User:** The text entered in the field "user" during step 1/6 of the device configuration. Fieldbus: Type: Str16; USS-Adr: 05 1E 40 00 hex	2879h	0h
E122.0 Global read (3)	**Download information:** Contains information on the last firmware download. Fieldbus: Type: Str16; USS-Adr: 05 1E 80 00 hex	287Ah Array	0h
E122.1 Global read (3)	**Download information:** Contains information on the last firmware download. Fieldbus: Type: Str16; USS-Adr: 05 1E 80 01 hex	287Ah Array	1h
E122.2 Global read (3)	**Download information:** Contains information on the last firmware download. Fieldbus: Type: Str16; USS-Adr: 05 1E 80 02 hex	287Ah Array	2h
E122.3 Global read (3)	**Download information:** Contains information on the last firmware download. Fieldbus: Type: Str16; USS-Adr: 05 1E 80 03 hex	287Ah Array	3h
E149 Global read (1)	**Hardware Version:** Device family (FDS/MDS/SDS), hardware version of the power section (layout version), power section manufacturing date (calendar week and year). Fieldbus: Type: Str16; USS-Adr: 05 25 40 00 hex	2895h	0h
E151 Global read (2)	**Active switching frequency:** The current switching frequency used by the inverter. Fieldbus: 1LSB=1kHz; Type: U8; USS-Adr: 05 25 C0 00 hex	2897h	0h
E153 Global read (3)	**Accumulated raw-motor-encoder:** Supplies an accumulated raw value of the motor encoder parameterized in **B26**. The value contains the value of **B35** as the adding offset. Since these values are raw values, scaling depends on the motor encoder being used. • EnDat®, SSI: MSB=2048U • Resolver: 65536LSBs=1U (i.e., MSB=32768U) • Incremental encoder: 1LSB=1Count (4-fold evaluation of the number of markers) MSB = Most Significant Bit LSB = Least Significant Bit Fieldbus: 1LSB=1; PDO ; Type: U32; USS-Adr: 05 26 40 00 hex	2899h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E154 Global read (3)	**Raw motor-encoder:** Supplies the raw value of the motor encoder parameterized in **B26**. The value contains the value of **B35** as the adding offset. Since these values are raw values, scaling depends on the motor encoder being used. • EnDat®, SSI: MSB=2048U • Resolver: 65536LSBs=1U (i.e., MSB=32768U) • Incremental encoder: 1LSB=1Count (4-fold evaluation of the number of markers), Counter resolution: 16 bits MSB = Most Significant Bit LSB = Least Significant Bit Fieldbus: 1LSB=1; PDO ; Type: U32; USS-Adr: 05 26 80 00 hex	289Ah	0h
E155 Global read (3)	**Raw position-encoder:** Raw value of the encoder parameterized in **I02**. The format varies depending on which encoder is used. For EnDat® and SSI encoders, the data word is specified left-justified by the encoder. Example: - EnDat® Multiturn, SSI: MSB = 2048 encoder revolutions - EnDat® Singleturn, resolver: MSB = 0.5 encoder revolutions - Incremental encoder: Only the upper 16 bits are used. They contain the counted increments after 4-fold evaluation. MSB = Most Significant Bit Fieldbus: 1LSB=1; PDO ; Type: U32; USS-Adr: 05 26 C0 00 hex	289Bh	0h
E156 Global read (3)	**Raw master-encoder:** Raw value of the encoder parameterized in **G27**. The format varies with the encoder being used. Example: - EnDat® Multiturn, SSI: MSB = 2048 encoder revolutions - EnDat® Singleturn, resolver: MSB = 0.5 encoder revolutions - Incremental encoder: Only the upper 16 bits are used. They contain the counted increments after 4-fold evaluation. MSB = Most Significant Bit Fieldbus: 1LSB=1; PDO ; Type: U32; USS-Adr: 05 27 00 00 hex	289Ch	0h
E157 Axis read (2)	**Latched counter value:** When block 100996 is instanced, the value of the incremental counter is latched and made available in **E157** the first time a zero pulse occurs on a connected incremental encoder which is set in **I02** as the position encoder. Fieldbus: 1LSB=1; PDO ; Type: U16; USS-Adr: 05 27 40 00 hex	289Dh	0h
E158 Axis read (2)	**State of counter latch:** When block 100996 is instanced, the value of the incremental counter is latched the first time a zero pulse occurs on a connected incremental encoder which is set in **I02** as the position encoder. **E158** remains "0:inactive" up to this time. Afterwards **E158** becomes "1:active." *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: B; USS-Adr: 05 27 80 00 hex	289Eh	0h
E161 Global read (3)	**n-rmpg:** The speed reference value on the output of the ramp generator. Fieldbus: 1LSB=0,1rpm; PDO ; Type: I32; (raw value:14 Bit=1·rpm); USS-Adr: 05 28 40 00 hex	28A1h	0h
E165 Global read (3)	**Id-ref:** Reference value for the flux current in %. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 29 40 00 hex	28A5h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E166 Global read (3)	**Iq-ref:** Reference value for the torque generating current in %. Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 29 80 00 hex	28A6h	0h
E167 Global read (3)	**Power module state:** Specifies whether the power end stage is enabled. *192: power module off;* *248: activate power module;* *255: power module on;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 05 29 C0 00 hex	28A7h	0h
E170 Global read (2)	**T-reference:** Only for control types with torque specification. Reference torque currently required by the speed controller. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 05 2A 80 00 hex	28AAh	0h
E174 Global read (3)	**CRC-counter:** Counts non-volatilely the CRC and Busy errors which occurred on EnDat® encoders. The occurrence of CRC errors indicates EMC problems. This value can be reset with **A37**→1. Fieldbus: 1LSB=1; Type: U32; USS-Adr: 05 2B 80 00 hex	28AEh	0h
E175 Global read (3)	**SSI-errors:** Counts the erroneous protocols which occur with SSI encoders. Erroneous protocols are recognized when the maximum incremental value contained in **H900** exceeds two consecutive protocols. The erroneous value is rejected. When the second error occurs in succession, the system malfunctions (maximum following error, encoder). **NOTE** **The parameter H900 can only be read/changed by level-4 users.** Fieldbus: 1LSB=1; Type: U32; USS-Adr: 05 2B C0 00 hex	28AFh	0h
E180 Global read (3)	**Status positive T-limit:** The positive torque limit is in effect. In the "comfort reference value" application, the signal can be read in **D200** Bit 3 in fieldbus mode. *0: inactive*; *1: active*; Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 2D 00 00 hex	28B4h	0h
E181 Global read (3)	**Status negative T-limit:** The negative torque limit is in effect. In the "comfort reference value" application, the signal can be read in **D200** Bit 4 in fieldbus mode. *0: inactive*; *1: active*; Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 2D 40 00 hex	28B5h	0h
E182 Global read (3)	**Status positive n-limit:** With operation with speed limiter or with torque control (**C61**=1), the positive maximum speed was reached. With operation without speed limiter or with speed control (**C61**=0), a too large positive reference value speed was limited to +**C01**. *0: inactive*; *1: active*; Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 2D 80 00 hex	28B6h	0h
E183 Global read (3)	**Status negative n-limit:** With operation with speed limiter or torque control (**C61**=1), the negative maximum speed was reached. With operation without speed limiter or with speed control (**C61**=0), an excessively negative reference value speed was limited to -**C01**. *0: inactive*; *1: active*; Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 2D C0 00 hex	28B7h	0h

E.. Display Value			
Par.	**Description**	**Fieldbus-address**	
E186 Global read (3)	**Status motoring T-limit:** When the level is high, the torque has reached the motor torque limit. The signal can be read in **D200** Bit5 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 2E 80 00 hex	28BAh	0h
E187 Global read (3)	**Status generating T-limit:** When the level is high, the torque has reached the generator torque limit. The signal can be read in **D200** Bit6 in fieldbus mode. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 2E C0 00 hex	28BBh	0h
E191 Global r=2, w=4	**Runtime usage:** Indication of the relative utilization of the real-time task by the graphic configuration. The maximum value is calculated for each cycle of the configuration. When utilization is too high (> approx. 75%), the cycle time in **A150** should be set to a higher value. With changes of **A150**, **E191** starts at 0%. Fieldbus: 1LSB=1%; Type: U16; raw value:1LSB=Fnct.no.9; USS-Adr: 05 2F C0 00 hex	28BFh	0h
E200 Global read (2)	**Device status byte:** This byte contains status signals of the device controller. • Bit-0: Enabled. The drive is ready. No faults, the device status corresponds to **E84**=*4:Oper. enabled*. • Bit-1: Error. Device status is "fault reaction active" or "fault." • Bit-2: Quick stop (also quick stop in "fault reaction active"). • Bit-3, 4: With multiple-axis operation, the active axis is shown here. Bit 4 Bit 3 Axis 0 0 Axis 1 0 1 Axis 2 1 0 Axis 3 1 1 Axis 4 • Bit-5: Axis in **E84** is active. • Bit-6: Local: Local operation is activated. • Bit-7: Bit 7 in **A180** (device control byte) is copied once every device controller cycle to bit 7 in **E200** (device status byte). When bit 7 in **A180** is toggled, the higher-level PLC is informed of a concluded communication cycle (send, evaluate, return data). For PROFIBUS for example, this permits cycle-time-optimized communication. The handshake bit 7 in **A180** / **E200** supplies no information as to whether the application has reacted to the process data. Depending on the application, other routines are provided for this (e.g., motion-Id for command positioning). **NOTE** You can only use the toggle signal of bit 7 when device controllers *3:terminals*, *4:USS*, *5:CANopen*, *6:PROFIBUS* or *23:EtherCAT* are used. If you configured a DSP 402 device controller, bit 7 always has signal status 0. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 05 32 00 00 hex	28C8h	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F01 Axis r=2, w=2	**n brake release:** When the ramp generator exceeds this speed during startup, the brake is released. *Value range in rpm: 1 ... 1 ... 8191* Fieldbus: 1LSB=1rpm; Type: I16; (raw value:32767 = 8191 rpm); USS-Adr: 06 00 40 00 hex	2A01h	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F02 Axis r=2, w=2	**n-brake set:** When this speed is passed below during halting, the brake is applied. *Value range in rpm: 1 ... 30 ... 8191* Fieldbus: 1LSB=1rpm; Type: I16; (raw value:32767 = 8191 rpm); USS-Adr: 06 00 80 00 hex	2A02h	0h
F06 Axis r=2, w=3	**T-brake release:** Only when **F08**=1 (brake). Defines the release time of the connected brake. **F06** must be selected approx. 30 msec greater than the time t1 in section M of the STÖBER SMS catalog or t2 in section M of the STÖBER catalog on the ED + EK servo motors. When the halt/quick stop signal is enabled or removed, the release is delayed by the time **F06**. **Caution!** When a coupling relay is used, the brake release time must be increased by the trigger time of the relay. *Value range in ms: 0 ... 0 ... 32767* Fieldbus: 1LSB=1ms; Type: I16; USS-Adr: 06 01 80 00 hex	2A06h	0h
F07 Axis r=2, w=3	**T-brake set:** Only when **F08**=1 (brake). Defines the application time of the connected brake. **F07** must be selected approx. 30 msec greater than the time t2 (SMS catalog) or t11 (catalog on ED + EK servo motors). With the removal of the enable and halt/quick stop, the drive still remains in the control for the time **F07**. **Caution!** When a coupling relay is used, the brake application time must be extended by the opening time of the rely. *Value range in ms: 0 ... 0 ... 32767* Fieldbus: 1LSB=1ms; Type: I16; USS-Adr: 06 01 C0 00 hex	2A07h	0h
F08 Axis r=2, w=2	**Brake:** Activates the control of the halting brake by the inverter. When **F08** is parameterized to *"0:inactive,"* output X2 corresponds to the state of **A900**. *0: inactive;* The brake is always released and is not controlled by the inverter (24 V on X2). *1: active;* The brake is controlled by the inverter. After expiration of the brake application time **F07**, the motor is automatically de-energized! The brake is applied, for example, after the halt or quick stop signal as well as when the enable is removed. *2: do not save torque;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 02 00 00 hex	2A08h	0h
F11 Axis r=2, w=2	**AE1-Offset:** **F11** is added to **E10**. The result is multiplied by **F12**. This signal is supplied to the configuration. To compensate for an offset (the value which arrives at the inverter when the controller specifies 0 V), this must be entered in **F11** with the opposite sign. *Value range in V: -10.000 ... 0,000 ... 10.000* Fieldbus: 1LSB=0,001V; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 06 02 C0 00 hex 👁 Only when a board is installed in the bottom option slot.	2A0Bh	0h
F12 Axis r=2, w=2	**AE1-gain:** The result of the addition of **F11** and **E10** is multiplied by **F12**. This signal is supplied to the configuration. *Value range in %: -400.0 ... 100,0 ... 400.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=400,0%); USS-Adr: 06 03 00 00 hex 👁 Only when a board is installed in the bottom option slot.	2A0Ch	0h
F13 Axis r=2, w=2	**AE1 ref low pass filter:** The time constant for filtering a reference value specified on AE1 is parameterized in **F13**. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 06 03 40 00 hex	2A0Dh	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F14 Axis, OFF r=2, w=2	**AE1-mode selector:** The reference value mode for AE1 is set in **F14**. When *0: -10V* to *10V* is selected, a voltage reference value can be connected to AE1 in the specified range. The selections 1 and 2 can be set when a current reference value is specified. With *1: 0* to *20mA* the specification 0 mA is interpreted as the minimum reference value and 20 mA as the maximum reference value. This interpretation is reversed for the setting 2. In other words, at 0 mA (wire break) the motor is activated with the maximum reference value (pump control). Wire break monitoring can be activated in **F15** for the settings 3 and 4. With these settings a current reference value of 4 to 20 mA is connected. With *3: 4* to *20 mA,* 4 mA is processed as the minimum reference value and 20 mA as the maximum reference value. When the selection is *4: 20* to *4 mA*, processing is reversed (i.e., at 4 mA the motor is activated with the maximum reference value). *0: -10V to 10V;* *1: 0 to 20mA;* *2: 20 to 0mA;* *3: 4 to 20mA;* *4: 20 to 4mA;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 03 80 00 hex	2A0Eh	0h
F15 Axis r=2, w=2	**Wire breakage sensing:** When **F14** is set to *3: 4* to *20 mA* or *4: 20* to *4 mA*, wire break monitoring can be activated in **F15**. Active wire break monitoring means that application event 4 will be generated as per the parameterization in **U140** to **U142** if a wire break occurs. The drive continues at the velocity which was valid before the wire break until either a fault is generated by the event parameterization, the enable is switched off or the drive is stopped with a stop or quick stop command. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 06 03 C0 00 hex	2A0Fh	0h
F21 Axis r=2, w=2	**AE2-Offset: F21** is added to **E16**. The result is multiplied by **F22**. This signal is supplied to the configuration. To compensate for an offset (the value which arrives at the inverter when the controller specifies 0 V), this must be entered in **F21** with the opposite sign. *Value range in V: -10.000 ... 0,000 ... 10.000* Fieldbus: 1LSB=0,001V; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 06 05 40 00 hex 👁 Only when a board is installed in the bottom option slot.	2A15h	0h
F22 Axis r=2, w=2	**AE2-gain: F21** is added to **E16**. The result is multiplied by **F22**. This signal is supplied to the configuration. *Value range in %: -400.0 ... 100,0 ... 400.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=400,0%); USS-Adr: 06 05 80 00 hex 👁 Only when a board is installed in the bottom option slot.	2A16h	0h
F23 Axis r=2, w=2	**AE2 ref low pass filter:** The time constant for filtering a reference value specified on AE2 is parameterized in **F23**. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 06 05 C0 00 hex	2A17h	0h
F31 Axis r=2, w=2	**AE3-Offset: F31** is added to **E74**. The result is multiplied by **F32**. This signal is supplied to the configuration. To compensate an offset (the value which arrives at the inverter when the controller specifies 0 V), this must be entered in **F31** with opposite sign. *Value range in V: -10.000 ... 0,000 ... 10.000* Fieldbus: 1LSB=0,001V; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 06 07 C0 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A1Fh	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F32 Axis r=2, w=2	**AE3-gain:** **F31** is added to **E74**. The result is multiplied by **F32**. This signal is supplied to the configuration. *Value range in %: -400.0 ... 100,0 ... 400.0* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:32767·LSB=400,0%); USS-Adr: 06 08 00 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A20h	0h
F33 Axis r=2, w=2	**AE3 ref low pass filter:** The time constant for filtering a reference value specified on AE3 is parameterized in **F33**. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 06 08 40 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A21h	0h
F40 Axis r=2, w=2	**Analog-output1-source:** The value of the parameterized coordinates is output on analog output (X100.6). A voltage of ±10 V is available on the terminals. The resolution is approx. 10 mV. The scanning time corresponds to **A150**. Only parameters with the data type "16-bit with sign" can be used as source (**I16**, see parameter editor, ±16384=±10 V). *Value range: A00 ... E08 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 0A 00 00 hex 👁 Only when a board is installed in the bottom option slot.	2A28h	0h
F41 Axis r=2, w=2	**Analog-output1-offset:** Offset of the analog output 1. The signal is multiplied by **F42**. **F41** is then added. *Value range in V: -10.000 ... 0,000 ... 10.000* Fieldbus: 1LSB=0,001V; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 06 0A 40 00 hex 👁 Only when a board is installed in the bottom option slot.	2A29h	0h
F42 Axis r=2, w=2	**Analog-output1-gain:** The signal is multiplied by **F42**. **F41** is then added. *Value range in %: -3198.9 ... 100,0 ... 3198.9* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:1024·LSB=100%); USS-Adr: 06 0A 80 00 hex 👁 Only when a board is installed in the bottom option slot.	2A2Ah	0h
F43 Axis r=2, w=2	**Analog-output1-act low pass filter:** The time constant for filtering an actual value which was output on analog output 1 is parameterized in **F43**. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 06 0A C0 00 hex	2A2Bh	0h
F44 Axis r=2, w=2	**Analog-output1-absolut:** Generation of the amount for analog output 1 can be activated in **F44**. When **F44** is set to *1:active*, the amount of the parameter entered in **F40** is output on analog output 1. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 06 0B 00 00 hex	2A2Ch	0h
F50 Axis r=2, w=2	**Analog-output2-source:** The value of the parameterized coordinates is output on analog output (X100.7). A voltage of ±10 V is available on the terminals. The resolution is approx. 10 mV. The scanning time corresponds to **A150**. Only parameters with the data type "16-bit with sign" can be used as source (**I16**, see parameter editor, ±16384=±10 V). *Value range: A00 ... E00 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 0C 80 00 hex 👁 Only when a board is installed in the bottom option slot.	2A32h	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F51 Axis r=2, w=2	**Analog-output2-offset:** Offset of the analog output 2. The signal is multiplied by **F52**. **F51** is then added. *Value range in V: -10.000 ... 0,000 ... 10.000* Fieldbus: 1LSB=0,001V; Type: I16; (raw value:32767 = 20.000 V); USS-Adr: 06 0C C0 00 hex 👁 Only when a board is installed in the bottom option slot.	2A33h	0h
F52 Axis r=2, w=2	**Analog-output2-gain:** The signal is multiplied by **F52**. **F51** is then added. *Value range in %: -3198.9 ... 100,0 ... 3198.9* Fieldbus: 1LSB=0,1%; Type: I16; (raw value:1024·LSB=100%); USS-Adr: 06 0D 00 00 hex 👁 Only when a board is installed in the bottom option slot.	2A34h	0h
F53 Axis r=2, w=2	**Analog-output2-act low pass filter:** The time constant for filtering an actual value which was output on analog output 2 is parameterized in **F53**. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 06 0D 40 00 hex	2A35h	0h
F54 Axis r=2, w=2	**Analog-output2-absolut:** Generation of the amount for analog output 2 can be activated in **F54**. When **F54** is set to *1:active*, the amount of the parameter entered in **F50** is output on analog output 2. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 06 0D 80 00 hex	2A36h	0h
F61 Axis r=2, w=2	**BA1-source:** The value of the parameterized coordinate is output on binary output 1 (X101.8). **NOTE** Please remember that binary output BA1 is already being used by the encoder simulation via the binary outputs. In this case no entry is permitted in **F61**. *Value range: A00 ... F181 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 0F 40 00 hex 👁 Only when a board is installed in the bottom option slot.	2A3Dh	0h
F62 Axis r=2, w=2	**BA2-source:** The value of the parameterized coordinate is output on binary output 2 (X101.9). **NOTE** Please remember that binary output BA2 is already being used by the encoder simulation via the binary outputs. In this case no entry is permitted in **F62**. *Value range: A00 ... F182 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 0F 80 00 hex 👁 Only when a board is installed in the bottom option slot.	2A3Eh	0h
F63 Axis r=2, w=2	**BA3-source:** The value of the parameterized coordinate is output on binary output 1 (X103.1). *Value range: A00 ... F183 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 0F C0 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A3Fh	0h
F64 Axis r=2, w=2	**BA4-source:** The value of the parameterized coordinate is output on binary output 4 (X103.2). *Value range: A00 ... F184 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 10 00 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A40h	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F65 Axis r=2, w=2	**BA5-source:** The value of the parameterized coordinate is output on binary output 5 (X103.3). *Value range: A00 ... F185 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 10 40 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A41h	0h
F66 Axis r=2, w=2	**BA6-source:** The value of the parameterized coordinate is output on binary output 6 (X103.4). *Value range: A00 ... F186 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 10 80 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A42h	0h
F67 Axis r=2, w=2	**BA7-source:** The value of the parameterized coordinate is output on binary output 7 (X103.5). *Value range: A00 ... F187 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 10 C0 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A43h	0h
F68 Axis r=2, w=2	**BA8-source:** The value of the parameterized coordinate is output on binary output 8 (X103.6). *Value range: A00 ... F188 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 11 00 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A44h	0h
F69 Axis r=2, w=2	**BA9-source:** The value of the parameterized coordinate is output on binary output 9 (X103.7). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 11 40 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A45h	0h
F70 Axis r=2, w=2	**BA10-source:** The value of the parameterized coordinate is output on binary output 10 (X103.8). Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 06 11 80 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2A46h	0h
F80 Axis r=2, w=2	**BA1 on delay:** A signal which is output on BA1 can be delayed with the parameters **F80** and **F81**. When a value is entered in **F80**, the switchon procedure of the signal is delayed by this number of milliseconds. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 06 14 00 00 hex 👁 Only when a board is installed in the bottom option slot.	2A50h	0h
F81 Axis r=2, w=2	**BA1 off delay:** A signal which is output on BA1 can be delayed with the parameters **F80** and **F81**. When a value is entered in **F81**, the switchoff procedure of the signal is delayed by this number of milliseconds. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 06 14 40 00 hex 👁 Only when a board is installed in the bottom option slot.	2A51h	0h
F82 Axis r=2, w=2	**BA1 inverting:** When the parameter **F82** is activated, the output of the signal entered in **F61** is inverted on BA1. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 06 14 80 00 hex 👁 Only when a board is installed in the bottom option slot.	2A52h	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F83 Axis r=2, w=2	**BA2 on delay:** A signal which is output on BA2 can be delayed with the parameters **F83** and **F84**. When a value is entered in **F83**, the switchon procedure of the signal is delayed by this number of milliseconds. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 06 14 C0 00 hex 👁 Only when a board is installed in the bottom option slot.	2A53h	0h
F84 Axis r=2, w=2	**BA2 off delay:** A signal which is output on BA2 can be delayed with the parameters **F83** and **F84**. When a value is entered in **F84**, the switchon procedure of the signal is delayed by this number of milliseconds. *Value range in ms: 0 ... 0 ... 4294967* Fieldbus: 1LSB=1ms; Type: U32; (raw value:1LSB=0,00099999993131496·ms); USS-Adr: 06 15 00 00 hex 👁 Only when a board is installed in the bottom option slot.	2A54h	0h
F85 Axis r=2, w=2	**BA2 inverting:** When the parameter **F85** is activated, the output of the signal entered in **F62** is inverted on BA2. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 06 15 40 00 hex 👁 Only when a board is installed in the bottom option slot.	2A55h	0h
F90 Global r=2, w=3	**Release time axis-switch:** Specifies the release time of the contactor used for the axis switchover. This minimum time is waited before the inverter lets the next contactor be applied. *Value range in ms: 0 ... 20 ... 32767* Fieldbus: 1LSB=1ms; Type: I16; USS-Adr: 06 16 80 00 hex	2A5Ah	0h
F91 Global r=2, w=3	**Set time axis-switch:** Specifies the set time of the contactor used for the axis switchover. This time is at least waited before the inverter lets the axis be electrified. *Value range in ms: 0 ... 20 ... 32767* Fieldbus: 1LSB=1ms; Type: I16; USS-Adr: 06 16 C0 00 hex	2A5Bh	0h
F100 Global, OFF r=1, w=1	**Brake release source:** Selection of the source for the "release brake" signal. The signal can be permanently pre-specified as supplied by the binary inputs or the fieldbus. With **F100**=*2:Parameter*, **A180**, bit 6 (global parameter) is used as the signal source. This is the setting for fieldbus operation. **Caution:** The "release brake" signal releases the brake regardless of the device state - this may cause accidental movements. *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;*	2A64h	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
	18: BE8-inverted; *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 19 00 00 hex		
F181 Global read (1)	**BA1:** Bit 0 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE1 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2D 40 00 hex 👁 Only when a board is installed in the bottom option slot.	2AB5h	0h
F182 Global read (1)	**BA2:** Bit 1 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE2 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2D 80 00 hex 👁 Only when a board is installed in the bottom option slot.	2AB6h	0h
F183 Global read (1)	**BA3:** Bit 2 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE3 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2D C0 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2AB7h	0h
F184 Global read (1)	**BA4:** Bit 3 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE4 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2E 00 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2AB8h	0h
F185 Global read (1)	**BA5:** Bit 4 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE5 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2E 40 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2AB9h	0h
F186 Global read (1)	**BA6:** Bit 5 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE6 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2E 80 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2ABAh	0h

F.. Control Interface			
Par.	**Description**	**Fieldbus-address**	
F187 Global read (1)	**BA7:** Bit 6 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE7 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2E C0 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2ABBh	0h
F188 Global read (1)	**BA8:** Bit 7 from the *BA control bits* byte **F210**. In the "comfort reference value" application, the status of BE8 can be indicated based on **F209**. *0: Low;* *1: High;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 06 2F 00 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2ABCh	0h
F200 Global read (2)	**BE-byte:** BE1-BE8 as bit pattern for space-saving transmission on the process data channel. Binary input 9 to 13 (only with XEA 5000 and XEA 5001 respectively) are available in parameter **E19**. Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 06 32 00 00 hex	2AC8h	0h
F209 Axis r=2, w=2	**Image of F200 to F210:** The parameter **F209** is used to set the external access to the binary outputs of the inverter. When **F209** is not activated, the bits are extracted from **F210** to the bit parameters **F181** to **F188**. When **F209** is activated, **F200** (BE1 to BE8) is copied to **F181…F188**. **F181** to **F188** can then be used to output the signals to the binary outputs (**F61** to **F70**). *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 06 34 40 00 hex	2AD1h	0h
F210 Global r=2, w=2	**BA control bits:** The parameter **F210** is primarily used to permit a higher-level controller access to the binary outputs of the inverter. The individual bits of **F210** are automatically extracted in the bit parameters **F181**...**F188**. With the help of the parameters **F61**...**F70**, the individual bits can be written to the binary outputs. In the "comfort reference value" application, the function of **F210** can be changed with the parameter **F209**. *Value range: 0 ... 00000000bin ... 255 (Representation binary)* Fieldbus: 1LSB=1; PDO ; Type: U8; USS-Adr: 06 34 80 00 hex 👁 Only when a board is installed in the bottom option slot.	2AD2h	0h

G.. Technology			
Par.	**Description**	**Fieldbus-address**	
G00 Axis r=2, w=3	**PID closed loop gain:** Total gain for the control error of the PID controller. The value of the control error indicated in **G180** is amplified with the gain **G00** and distributed in parallel to the P, I and D branch. *Value range in %: -200000.0 ... 100,0 ... 200000.0* Fieldbus: 1LSB=0,1%; Type: I32; (raw value:65536·LSB=100%); USS-Adr: 07 00 00 00 hex	2C00h	0h
G02 Axis r=2, w=3	**PID-controller Ki:** Factor for the integral gain of the control error of the PID controller (see also **G00**). Example: With **G00** = 100% and **G02** = 1 1/s and constant control error, the value of **G180** is reached at **G19** in one second. *Value range in 1/s: 0.00 ... 0,00 ... 30.00* Fieldbus: 1LSB=0,01·1/s; Type: I32; (raw value:2147483647 = 500000.00 x 1/s); USS-Adr: 07 00 80 00 hex	2C02h	0h

G.. Technology			
Par.	**Description**	**Fieldbus-address**	
G03 Axis r=2, w=3	**PID-controller Kd:** Factor for the differential gain of the control error of the PID controller (see also **G00**). *Value range in ms: 0.0 ... 0,0 ... 32768.0* Fieldbus: 1LSB=0,1ms; Type: I32; (raw value:16 Bit=1·ms); USS-Adr: 07 00 C0 00 hex	2C03h	0h
G06 Axis r=2, w=3	**PID-controller Kp2:** Factor for the proportional gain of the control error of the PID controller (see also **G00**). *Value range in %: 0.0 ... 100,0 ... 20000.0* Fieldbus: 1LSB=0,1%; Type: I32; (raw value:65536·LSB=100%); USS-Adr: 07 01 80 00 hex	2C06h	0h
G07 Axis r=2, w=3	**PID-controller low pass:** Time constant for the low pass filter of the differential portion. *Value range in ms: 0.0 ... 1,2 ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 07 01 C0 00 hex	2C07h	0h
G08 Axis r=2, w=3	**PID controller upper limit:** Maximum value which the PID can reach. When this limit is reached, **G181** or **G200** Bit3 is set to 1. *Value range in %: -400.0 ... 150,0 ... 400.0* Fieldbus: 1LSB=0,1%; Type: I32; (raw value:16384·LSB=100%); USS-Adr: 07 02 00 00 hex	2C08h	0h
G09 Axis r=2, w=3	**PID controller lower limit:** Minimum value which the PID can reach. When this limit is reached, **G182** or **G200** Bit4 is set to 1. *Value range in %: -400.0 ... -150,0 ... 400.0* Fieldbus: 1LSB=0,1%; Type: I32; (raw value:16384·LSB=100%); USS-Adr: 07 02 40 00 hex	2C09h	0h
G11 Axis r=2, w=3	**Tau lowpass actual value:** Specifies the time constant of the PT1 low pass. When the actual signal which is queued has noise, this can be filtered out. *Value range in ms: 0.0 ... 0,0 ... 5039.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 07 02 C0 00 hex	2C0Bh	0h
G12 Axis, OFF r=2, w=2	**Parametersource actual technologie value:** Specifies the source to be read out for the actual value. A coordinate such as "**E90**" (M-Motor) must be entered. Only parameters of data type I16 can be used as sources. *Value range: A00 ... G233 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 07 03 00 00 hex	2C0Ch	0h
G13 Axis r=2, w=3	**PID initial value:** Initial value for the working mode of the PID controller set in **G14**. *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; Type: I32; (raw value:16384·LSB=100%); USS-Adr: 07 03 40 00 hex	2C0Dh	0h
G14 Axis, OFF r=2, w=3	**PID mode:** Specifies the working mode of the PID controller. **G13** is used as an auxiliary parameter for this. When a mode causes the valid working range to be exceeded, the working range is limited by the limit value in **G08** or **G09**. *0: normal;* *1: Out=I-Part=0;* *2: Out=I-Part=G13;* *3: Out=G13,I-Part=Out-P;* *4: Out=PID keep,I-Part=G13;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 07 03 80 00 hex	2C0Eh	0h
G15 Axis r=2, w=3	**Technologie ref. value torque feedforward:** Weighting ratio for feed forward of the torque reference value. When **G15** = 0, feed forward is deactivated. *Value range in %: 0 ... 80 ... 100* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 07 03 C0 00 hex	2C0Fh	0h

G.. Technology			
Par.	**Description**	**Fieldbus-address**	
G16 Axis r=2, w=3	**PID ratio:** Weighting ratio of the PID controller. When **G16** = 0, the PID controller is deactivated. *Value range in %: 0 ... <u>100</u> ... 400* Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 07 04 00 00 hex	2C10h	0h
G18 Axis read (2)	**PID P-Part:** Observation parameter for monitoring the P portion of the PID controller. Fieldbus: 1LSB=0,1%; Type: I32; (raw value:16384·LSB=100%); USS-Adr: 07 04 80 00 hex	2C12h	0h
G19 Axis read (2)	**PID I-Part:** Observation parameter for monitoring the I portion of the PID controller. Fieldbus: 1LSB=0,1%; Type: I32; (raw value:16384·LSB=100%); USS-Adr: 07 04 C0 00 hex	2C13h	0h
G90 Global r=3, w=3	**PLL:** Activates PLL control. PLL control synchronizes the inverter with the SYNC telegrams of the CAN bus or the SYNC signal of the EtherCAT bus. *<u>0: inactive;</u>* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 07 16 80 00 hex	2C5Ah	0h
G91 Global r=3, w=3	**PLL phase-offset:** Time offset value between the arrival of the SYNC telegram and the phase position of the cycle time on the inverter. *Value range in µs: -32768 ... <u>-800</u> ... 32767* Fieldbus: 1LSB=1µs; Type: I16; USS-Adr: 07 16 C0 00 hex	2C5Bh	0h
G92 Global r=3, w=3	**PLL gain:** Proportional gain of PLL control. The gain must be reduced when the jitter of the SYNC telegrams increases. *Value range in %: 0.0 ... <u>20,0</u> ... 100.0* Fieldbus: 1LSB=0,1%; Type: I32; (raw value:2,14748E9·LSB=100%); USS-Adr: 07 17 00 00 hex	2C5Ch	0h
G93 Global r=3, w=3	**PLL low pass:** Determines the limit frequency of the low pass filter of PLL control. The time must be increased when the jitter of the SYNC telegrams increases. *Value range in ms: 0.0 ... <u>40,0</u> ... 200.1* Fieldbus: 1LSB=0,1ms; Type: I32; raw value:1LSB=Fnct.no.11; USS-Adr: 07 17 40 00 hex	2C5Dh	0h
G95 Global read (3)	**PLL status:** Shows the status of PLL control. • Bit-0: PLL status • Bit-1: PLL status 00 PLL engaged 01 Engaged, but more than half the control range is utilized (frequency too high). 10 Engaged, but more than half the control range is utilized (frequency too low). 11 PLL not engaged. • Bit-2: Is 1 when PLL has extended the internal cycle time (**A150**). • Bit-3: Is 1 when control hits the limits of the control range. • Bit-4: Is 1 when the measured cycle time (**G96**) is greater than the specification (**G98**). • Bit-5: Is 1 when **G90** = inactive (PLL is deactivated). • Bit-6: Reserved • Bit-7: Reserved Fieldbus: 1LSB=1; Type: U8; USS-Adr: 07 17 C0 00 hex	2C5Fh	0h
G96 Global read (3)	**PLL measured cycle-time:** Cycle time of the SYNC telegrams determined by PLL control. Fieldbus: 1LSB=1µs; Type: I32; USS-Adr: 07 18 00 00 hex	2C60h	0h

G.. Technology			
Par.	**Description**	**Fieldbus-address**	
G97 Global read (3)	**PLL cycle-correction:** Cycle correction specified by PLL control. Fieldbus: 1LSB=1clock-cycles; Type: I8; USS-Adr: 07 18 40 00 hex	2C61h	0h
G98 Global r=3, w=3	**Reference cycle-time:** Specified value for the cycle time of the SYNC telegram. *Value range in µs: 0 ... 4000 ... 8000* Fieldbus: 1LSB=1µs; Type: I16; USS-Adr: 07 18 80 00 hex	2C62h	0h
G100 Axis, OFF r=1, w=1	**Source negate technologie reference value:** Selection of the source for the *"neg.ref.value"* signal. When **G100**=*2:parameter* the control byte or control word is used as the signal source. This setting should be used for fieldbus operation. The control word can be set to different parameters for different applications. The list below indicates the control words for the different applications. The signal can be directly monitored via **G300** on the block input. *Application* / *Parameter* / *Bit* Technology controller / **G210** / **2** Comfort reference value / **D211** / **4** *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 07 19 00 00 hex	2C64h	0h

G.. Technology			
Par.	**Description**	**Fieldbus-address**	
G101 Axis, OFF r=1, w=1	**Source PID controller disable:** Disable selection of the source for the PID signal. When **G101**=*2:parameter* the control byte or control word is used as the signal source. This setting should be used for fieldbus operation. The control word can be set to different parameters for different applications. The list below indicates the control words for the different applications. The signal can be directly monitored via **G301** on the block input. *Application* / *Parameter* / *Bit* Technology controller / **G210** / **3** Comfort reference value / **D211** / **5** *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;* *15: BE7;* *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 07 19 40 00 hex	2C65h	0h
G102 Axis r=1, w=1	**Source PID controller set:** Set selection of the source for the PID controller signal. When **G102**=*2:parameter* the control byte or control word is used as the signal source. This setting should be used for fieldbus operation. The control word can be set to different parameters for different applications. The list below indicates the control words for the different applications. The signal can be directly monitored via **G302** on the block input. *Application* / *Parameter* / *Bit* Technology controller / **G210** / **4** Comfort reference value / **D211** / **6** *0: Low;* *1: High;* *2: parameter;* *3: BE1;* *4: BE1-inverted;* *5: BE2;* *6: BE2-inverted;* *7: BE3;* *8: BE3-inverted;* *9: BE4;* *10: BE4-inverted;* *11: BE5;* *12: BE5-inverted;* *13: BE6;* *14: BE6-inverted;*	2C66h	0h

G.. Technology			
Par.	**Description**	**Fieldbus-address**	
	15: BE7; *16: BE7-inverted;* *17: BE8;* *18: BE8-inverted;* *19: BE9;* *20: BE9-inverted;* *21: BE10;* *22: BE10-inverted;* *23: BE11;* *24: BE11-inverted;* *25: BE12;* *26: BE12-inverted;* *27: BE13;* *28: BE13-inverted;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 07 19 80 00 hex		
G132 Axis, OFF r=1, w=1	**Source technology reference value:** Selection of the source for the *"Tech.ref.Value"* signal. The reference value can be supplied by the analog inputs or by the fieldbus. When **G132**=*4:parameter* the parameter **G232** is used as the signal source. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 07 21 00 00 hex	2C84h	0h
G133 Axis, OFF r=1, w=1	**Source actual technology value:** Selection of the source for the *"Tech.ActValue"* signal. The actual value can be supplied by the analog inputs or by the fieldbus. When **G133**=*4:parameter* the parameter **G233** is used as the signal source. *0: 0 (zero);* *1: AE1;* *2: AE2;* *3: AE3;* *4: parameter;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 07 21 40 00 hex	2C85h	0h
G180 Axis read (2)	**PID control error:** Display parameter for the control error of the PID controller (**G180** = **G332** - **G333**). Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 07 2D 00 00 hex	2CB4h	0h
G181 Axis read (1)	**PID upper limit:** Binary signal, assumes the value "1" when the PID controller reaches the maximum permissible value (can be set with **G08**) on the output. In fieldbus mode the signal can be read for the following status words based on the selected application: *Application* / *Parameter* / *Bit* Technology controller / **G200** / **3** Comfort reference value / **D200** / **7** *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 07 2D 40 00 hex	2CB5h	0h
G182 Axis read (1)	**PID lower limit:** Binary signal, assumes the value "1" when the PID controller reaches the minimum permissible value (can be set with **G09**) on the output. In fieldbus mode the signal can be read for the following status words based on the selected application: *Application* / *Parameter* / *Bit* Technology controller / **G200** / **4** Comfort reference value / **D200** / **8** *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 07 2D 80 00 hex	2CB6h	0h

G.. Technology			
Par.	**Description**	**Fieldbus-address**	
G185 Axis read (2)	**PID set value:** Display parameter for the PID controller output after the weighting ratio (**G16**). Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=800,0%); USS-Adr: 07 2E 40 00 hex	2CB9h	0h
G232 Global r=2, w=3	**Technology reference value:** Technology reference value of the "technology controller" application (control variable of the control loop). The value is processed when **G132** is "*4:parameter*." *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 07 3A 00 00 hex	2CE8h	0h
G233 Global r=2, w=3	**Actual technology value:** Technology actual value of the "technology controller" application. The value is processed when **G133** is *4: parameter*. The actual value is filtered with a PT1 low pass (**G11**) before it is processed on the PID controller. *Value range in %: -200.0 ... 0,0 ... 200.0* Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 07 3A 40 00 hex	2CE9h	0h
G300 Axis read (2)	**Status negate technology reference value:** Display parameter for the current signal state on the input of the technology controller. **G300** shows the state regardless of the source selected in **G100**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 07 4B 00 00 hex	2D2Ch	0h
G301 Axis read (2)	**Status PID controller disable:** Display parameter for the current signal state on the input of the technology controller. **G301** shows the state regardless of the source selected in **G101**. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 07 4B 40 00 hex	2D2Dh	0h
G302 Axis read (2)	**Status PID Mode:** Display parameter for the current signal state on the input of the PID controller. **G302** shows the state regardless of the mode selected in **G14**. Fieldbus: 1LSB=1; Type: B; USS-Adr: 07 4B 80 00 hex	2D2Eh	0h
G332 Axis read (2)	**Status technology value:** Display parameter for the current reference value of the technology controller after the inversion point. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 07 53 00 00 hex	2D4Ch	0h
G333 Axis read (2)	**Status actual technology value:** Display parameter for the current actual value of the technology controller after the low pass filter. Fieldbus: 1LSB=0,1%; PDO ; Type: I16; (raw value:32767·LSB=200,0%); USS-Adr: 07 53 40 00 hex	2D4Dh	0h

H.. Encoder			
Par.	**Description**	**Fieldbus-address**	
H00 Axis, OFF r=2, w=2	**X4-function:** Function of encoder interface X4 (motor encoder). **NOTE** Please remember that only the setting *3:Incremental-encoder In* is available on the FDS 5000. **NOTE** Also please remember that a change in **H00** may cause position values to be rescaled (in positioning applications). Scaling can take several seconds. *0: inactive;* *3: incremental encoder in;* (only for asynchronous motors) *64: EnDat®;* *65: SSI master;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 00 00 00 hex	2E00h	0h
H01 Axis, OFF r=2, w=2	**X4-increments:** Number of increments for the encoder set in **H00**. With incremental encoders, each increment supplies 4 counting increments via the edge evaluation and thus a four-fold higher resolution of the position. *Value range in inc/r: 30 ... 1024 ... 8191* Fieldbus: 1LSB=1inc/r; Type: I16; USS-Adr: 08 00 40 00 hex 👁 Only when **H00** = *3:EncoderIn*.	2E01h	0h
H02 Axis, OFF r=2, w=2	**X4-inverted:** Inverts the sign of the angle supplied by the encoder in the encoder acquisition. Can be used for reversed phases. Adhere to **B05**! *0: inactive*; *1: active*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 00 80 00 hex 👁 Only when **H00** is not *0:inactive.*	2E02h	0h
H05 Axis, OFF r=2, w=2	**X4-SSI-code:** Type of coding of the angle via the SSI encoder. *0: gray;* *1: binary;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 01 40 00 hex 👁 Only when **H00** = *65:SSI-Master*.	2E05h	0h
H08 Axis, OFF r=2, w=2	**POSISwitch® encoder selector:** Available as an option, the POSISwitch® control module permits the connection of several motors to one inverter. In **H08** it can be set separately for each of the four (software) axes which connection on the POSISwitch® (i.e., which motor) is allocated to the particular axis configuration. This routine permits two or more applications to be run together on separate (software) axes with a single motor. **NOTE** Following a change in parameter **H08,** correct evaluation of the electronic nameplate is not ensured until after a device new start. *0: Enc1*; *1: Enc2*; *2: Enc3*; *3: Enc4*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 02 00 00 hex 👁 Only when a POSISwitch® was detected on X4.	2E08h	0h

H.. Encoder			
Par.	**Description**	**Fieldbus-address**	
H10 Axis, OFF r=2, w=2	**X4-SSI data bits:** With 24 or 25-bit evaluation, the 12-bit highest significance for rotary encoders corresponds to whole encoder rotations (multi-turns). Afterwards 12 or 13 bits within one rotation can still be coded. When 24-bit is set, the bit with the least significance is forced to 0. When 13-bit is set, all 13 bits code the angle within one rotation (single-turn). *0: 25* *1*: 24 *2*: 13 short; Evaluation of a single-turn SSI encoder with 13-bit telegram. *3*: 13 tree; Evaluation of a 13-bit single-turn SSI encoder with 25-bit telegram. The evaluation ignores the upper 12 bits. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 02 80 00 hex 👁 Only when **H00** = *65:SSI-Master*.	2E0Ah	0h
H11 Axis, OFF r=2, w=2	**X4 double transmission:** Switches off double transmission for SSI encoder. When double transmission is activated, the angle is scanned twice in immediate succession to increase data reliability. If the encoder does not support double transmission, the inverter automatically switches off the monitoring but continues to scan twice. When double transmission is switched off with this parameter, the inverter no longer generates a second scan. Double transmission should not be deactivated if the hardware permits this function. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 08 02 C0 00 hex 👁 Only when **H00** = *65:SSI-Master*.	2E0Bh	0h
H18 Global, OFF read (2)	**POSISwitch® port-status:** Indicates as a binary word the POSISwitch® ports to which encoders are connected. This is determined by the inverter during startup. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 04 80 00 hex 👁 Only when a POSISwitch® was detected on X4.	2E12h	0h
H40 Axis, OFF r=2, w=2	**BE-encoder:** Function of the encoder evaluation on BE3 (X101.13), BE4 (X101.14) and BE5 (X101.15). The binary inputs have the following functions for the different settings: *1: incremental encoder in* / *2: stepmotor in* **BE3**: Zero track / - **BE4**: Track A+ / (Increments) freq.+ **BE5**: Track B+ / (Direction of rotation) sign+ **NOTE** Also please remember that a change in **H40** may cause position values to be rescaled (in positioning applications). Scaling can take several seconds. *0: inactive;* *1: incremental encoder in;* *2: stepmotor In;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 0A 00 00 hex 👁 Only when a board is installed in the bottom option slot.	2E28h	0h
H41 Axis, OFF r=2, w=2	**BE-increments:** Increments per encoder revolution of the encoder on BE4 (X101.14) and BE5 (X101.15). With incremental encoders, each increment supplies 4 counting steps via edge evaluation and thus four times as high a resolution of the position. *Value range in inc/r: 30 ... 1024 ... 8191* Fieldbus: 1LSB=1inc/r; Type: I16; USS-Adr: 08 0A 40 00 hex 👁 Only when a board is installed in the bottom option slot and **H40** is not *0:inactive*.	2E29h	0h

H.. Encoder			
Par.	**Description**	**Fieldbus-address**	
H42 Axis, OFF r=2, w=2	**BE-inverted:** Inverts the sign of the angle supplied by the BE encoder in the encoder acquisition. Can be used for reversed motor phases. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 0A 80 00 hex 👁 Only when a board is installed in the bottom option slot and **H40** is not *0:inactive*.	2E2Ah	0h
H60 Axis, OFF r=2, w=2	**BA-encodersimulation:** Function of the encoder simulation on binary outputs BA1 and BA2 (terminals X101.16 and X101.17). The encoder simulation is available as system function in all applications. **Important:** The encoder simulation only works when no other function is assigned to the binary outputs. If present at all in the application, the corresponding parameters **F61** and **F62** may not contain any entries (blank input). *0: inactive;* *1: incremental encoder simulation;* *2: stepmotor Simulation;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 0F 00 00 hex 👁 Only when a board is installed in the bottom option slot.	2E3Ch	0h
H62 Axis, OFF r=2, w=2	**BA-inverted:** Inverts the sign of the BA encoder simulation. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 0F 80 00 hex 👁 Only when a board is installed in the bottom option slot and **H60** is not *0:inactive*.	2E3Eh	0h
H63 Axis, OFF r=2, w=2	**BA-increments:** Increments of the encoder simulation on BA1 / BA2. When the source is an absolute value encoder, **H63** specifies the increments as with a real incremental encoder. When the source is an incremental encoder, the scaling factor determines the selection. 1:2 means that half of the source increments are output on the BAs. *1: 64 i/r(1:16);* *2: 128 i/r(1:8);* *3: 256 i/r(1:4);* *4: 512 i/r(1:2);* *5: 1024 i/r(1:1);* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 0F C0 00 hex 👁 Only when a board is installed in the bottom option slot and **H60** is not *0:inactive*.	2E3Fh	0h
H67 Axis, OFF r=2, w=2	**BA-encodersimulation source:** Specifies which source is used as position encoder for the BA encoder simulation. *0: motor-encoder;* *1: Configuration*; **H67**=1 provides an opportunity to calculate as desired the increments to be output within the graphic configuration (e.g., as frequency proportionate to the motor torque). In standard applications, simulation with **H67**=1 usually does not take effect. *2: position-encoder;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 10 C0 00 hex 👁 Only when a board is installed in the bottom option slot and **H60** is not *0:inactive*.	2E43h	0h

H.. Encoder			
Par.	**Description**	**Fieldbus-address**	
H120 Axis, OFF r=2, w=2	**X120-Function:** Function of plug connector X120 on the expanded I/O terminal module (XEA 5000 and XEA 5001 respectively). **NOTE** The X120 interface on the REA 5000 option board permanently simulates TTL encoder signals in reference to a resolver connected to X140. This is the reason why this interface cannot be affected with **H120**. **NOTE** Also please remember that a change in **H120** may cause position values to be rescaled (in positioning applications). Scaling can take several seconds. *0: inactive;* *4: incremental encoder in;* *5: stepmotor In;* *67: SSI master;* *68: SSI slave;* *80: incremental encoder simulation;* *81: stepmotor Simulation;* *82: SSI simulation;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 1E 00 00 hex 👁 Only when an XEA board is installed in the bottom option slot.	2E78h	0h
H121 Axis, OFF r=2, w=2	**X120-increments:** Increments per encoder rotation of the encoder on X120. With incremental encoders each increment supplies 4 counting steps via edge evaluation and thus four times as high a resolution of the position. *Value range in inc/r: 30 ... 1024 ... 8191* Fieldbus: 1LSB=1inc/r; Type: I16; USS-Adr: 08 1E 40 00 hex 👁 Only when an XEA board is installed in the bottom option slot and an encoder input is parameterized in **H120**.	2E79h	0h
H122 Axis, OFF r=2, w=2	**X120-inverted:** Inverts the sign of the angle supplied by the X120 encoder in the encoder acquisition. Can be used for reversed motor phases. Adhere to **B05**! *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 1E 80 00 hex 👁 Either when an XEA board is installed in the lower option slot and **H120** is not *0:inactive* or when an REA board is installed in the lower option slot.	2E7Ah	0h
H123 Axis, OFF r=2, w=2	**X120-encoder simulation increments:** Increments of the encoder simulation on X120. When the source is an absolute value encoder, **H123** specifies the increments as with a real incremental encoder. When the source is an incremental encoder, the scaling factor provides the selection. 1:2 means that half of the source increments are output on X120. 2:1 means that twice as many increments are output on X120. **NOTE** The X120 interface on the REA 5000 option board permanently simulates TTL encoder signals in reference to a resolver connected to X140. This is the reason why the scaling factor set in **H123** always refers to X140 in this case. *1: 64 i/r(1:16);* *2: 128 i/r(1:8);* *3: 256 i/r(1:4);* *4: 512 i/r(1:2);* *5: 1024 i/r(1:1);* *6: 2048 i/r(2:1);* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 1E C0 00 hex 👁 Either when an XEA board is installed in the lower option slot and an encoder simulation is parameterized in **H120** or when an REA board is installed in the lower option slot.	2E7Bh	0h

H.. Encoder			
Par.	**Description**	**Fieldbus-address**	
H124 Axis, OFF r=2, w=2	**X120-zero position offset:** Shift the zero pulse during incremental encoder simulation. *Value range in °: 0.0 ... 0,0 ... 360.0* Fieldbus: 1LSB=0,1°; Type: I16; USS-Adr: 08 1F 00 00 hex 👁 Either when an XEA board is installed in the lower option slot and an encoder simulation is parameterized in **H120** or when an REA board is installed in the lower option slot.	2E7Ch	0h
H125 Axis, OFF r=2, w=2	**X120-SSI-Code:** Type of angle coding via the SSI encoder and for the SSI simulation. *0: gray;* *1: binary;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 1F 40 00 hex 👁 Only when an XEA board is installed in the bottom option slot and an SSI functionality is selected in **H120**.	2E7Dh	0h
H127 Axis, OFF r=2, w=2	**X120-encoder simulation source:** Specifies which source will be used as position encoder for the X120 encoder simulation. *0: motor-encoder;* *1: configuration;* *2: position-encoder;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 1F C0 00 hex 👁 Only when **E58** = XEA 5000 (and XEA 5001 respectively) and **H120** is greater than *80:Incremental-Encoder-Simulation*.	2E7Fh	0h
H130 Axis, OFF r=2, w=2	**X120-SSI-data bits:** With evaluation or simulation with 24 or 25 bit, the 12-bit highest significance for rotary encoders corresponds to whole encoder rotations (multi-turns). Afterwards 12 or 13 bits can still be coded within one rotation. When 24 bit is set, the bit with the least significance is forced to 0. With a setting to 13 bits, all 13 bits code the angle within one rotation (single-turn). **NOTE** Note that the SSI data bits are set with the parameter **H126** in version V 5.2. For questions concerning the documentation of **H126**, contact electronics@stoeber.de. *0: 25* *1: 24* *2*: *13 short*; Evaluation or simulation of a single-turn SSI encoder with 13-bit telegram *3*: *13 tree*; Evaluation or simulation of a single-turn SSI encoder with 25-bit telegram. The upper 12 bits are ignored for the evaluation. For simulation, 0 is forced. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 20 80 00 hex 👁 Only when an XEA board is installed in the bottom option slot and an SSI functionality is selected in **H120**.	2E82h	0h
H131 Axis, OFF r=2, w=2	**X120 double transmission:** Switches off double transmission for SSI encoder. When double transmission is activated, the angle is scanned twice in immediate succession to increase data reliability. If the encoder does not support double transmission, the inverter automatically switches off the monitoring but continues to scan twice with running switching cycle. When double transmission is switched off with this parameter, the inverter no longer generates a second scan. **NOTE** Double transmission should not be deactivated if the hardware permits this function. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 08 20 C0 00 hex 👁 Only when an XEA board is installed in the bottom option slot and an SSI functionality is selected in **H120**.	2E83h	0h

H.. Encoder			
Par.	**Description**	**Fieldbus-address**	
H132 Axis, OFF r=3, w=3	**SSI-Timeout:** The parameter activates timeout monitoring for SSI simulation on X120. Timeout monitoring triggers fault 37 when no position has been scanned during the last 5 ms (approx.). If timeout monitoring is deactivated, the higher-level controller must ensure that the SSI transmission is error-free and within the correct cycle. This monitoring is then switched off on the drive! When the SSI simulation is part of an SSI motion bus (e.g., synchronous operation, cam), monitoring must remain on. Otherwise the SSI motion bus is not safe and, with it, the application. When the simulation is ready for operation after the inverter starts up, it also takes approx. 5 s before monitoring starts even if timeout is already activated. This gives the evaluated device (controller, other inverter) a somewhat longer startup time before the fault is triggered. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 08 21 00 00 hex 👁 Only when **E58** = XEA 5000 (and XEA 5001 respectively) and **H120** is greater than *80:Incremental-Encoder-Simulation*.	2E84h	0h
H140 Axis, OFF r=2, w=2	**X140-function:** Function of plug connector X140 on the resolver I/O terminal module (REA 5000). **NOTE** Also please remember that a change in **H140** may cause position values to be rescaled (in positioning applications). Scaling can take several seconds. *0: inactive;* *66: resolver;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 23 00 00 hex 👁 Only when a resolver option board is installed in the bottom option slot.	2E8Ch	0h
H142 Axis, OFF r=2, w=2	**X140-inverted:** Inverts the sign of the angle supplied by the X140 encoder in the encoder acquisition. Can be used for reversed motor phases. Adhere to **B05**! *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 08 23 80 00 hex 👁 Only when a resolver option board is installed in the bottom option slot and **H140** is not *0:inactiv*e.	2E8Eh	0h

R.. Production data			
Par.	**Description**	**Fieldbus-address**	
R01.0 Global read (3)	**Hardware-version power-unit for hardware:** Number specifying the hardware status of the power pack. All changes in the hardware states are counted here. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 12 00 40 00 hex	4201h	0h
R01.1 Global read (3)	**Hardware-version power-unit for software :** Number specifying the hardware status of the power pack. Only changes in the hardware states which require a software adjustment are counted here. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 12 00 40 01 hex	4201h	1h
R02 Global read (3)	**Power phases:** Specifies whether the device is a single-phase or three-phase device. *0: Single-phase;* *1: Three-phase;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 12 00 80 00 hex	4202h	0h

R.. Production data			
Par.	**Description**	**Fieldbus-address**	
R03 Global read (3)	**Power supply:** Power supply of the input rectifier. Fieldbus: 1LSB=1V; Type: I16; USS-Adr: 12 00 C0 00 hex	4203h	0h
R04 Global read (3)	**Nominal current async:** Nominal current of the inverter for operation of asynchronous machines and normal switching (**B24**=4 kHz). Fieldbus: 1LSB=0,001A; Type: I32; USS-Adr: 12 01 00 00 hex	4204h	0h
R05 Global read (3)	**Upper temperature limit:** Maximum permissible inverter temperature. When the measured inverter temperature **E25** exceeds this value, a fault *"38: Temperature device sensor"* is triggered. Fieldbus: 1LSB=1°C; Type: I16; (raw value:32767 = 328 °C); USS-Adr: 12 01 40 00 hex	4205h	0h
R24 Global read (3)	**Nominal current servo:** Nominal current of the inverter during operation with servo motors and normal switching (**B24**=8 kHz). Fieldbus: 1LSB=0,001A; Type: I32; USS-Adr: 12 06 00 00 hex	4218h	0h
R25 Global read (3)	**Lower temperature limit:** Minimum permissible inverter temperature. When the measured inverter temperature **E25** passes below this value, a fault *"38: Temperature device sensor"* is triggered. May indicate that the temperature sensor is defective. Fieldbus: 1LSB=1°C; Type: I16; (raw value:32767 = 328 °C); USS-Adr: 12 06 40 00 hex	4219h	0h
R26 Global read (3)	**Maximum current async:** Specifies the current strength above which the inverter triggers a fault *"33: overcurrent"* during operation with ASM. Specification is made in %, reference value is **R04**. Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 12 06 80 00 hex	421Ah	0h
R27 Global read (3)	**Maximum current servo:** Specifies the current strength above which the inverter triggers a fault *"33: overcurrent"* during operation with servo. Specification is made in %, reference value is **R24**. Fieldbus: 1LSB=1%; Type: I16; (raw value:32767·LSB=800%); USS-Adr: 12 06 C0 00 hex	421Bh	0h
R28 Global read (3)	**Upper voltage limit:** Maximum permissible DC link voltage. When the measured DC link voltage **E03** exceeds this value, a fault *"36: high voltage"* is triggered. Fieldbus: 1LSB=1V; Type: I16; (raw value:32767 = 3277 V); USS-Adr: 12 07 00 00 hex	421Ch	0h
R29 Global read (3)	**Lower voltage limit:** Minimum required DC link voltage. Represents the lower limit for parameter **A35**. Fieldbus: 1LSB=1V; Type: I16; (raw value:32767 = 3277 V); USS-Adr: 12 07 40 00 hex	421Dh	0h
R30 Global read (3)	**Brake chopper available:** Specifies whether a brake resistance can be connected to the inverter. *0: inactive;* No brake resistance possible. *1: active;* Brake resistance possible. Fieldbus: 1LSB=1; Type: B; USS-Adr: 12 07 80 00 hex	421Eh	0h
R31 Global read (3)	**Brake chopper on level:** The brake chopper is turned on at the latest when this value is exceeded. Fieldbus: 1LSB=1V; Type: I16; (raw value:32767 = 3277 V); USS-Adr: 12 07 C0 00 hex	421Fh	0h
R32 Global read (3)	**Brake chopper off level:** The brake chopper is switched off at the latest when this value is passed below. Fieldbus: 1LSB=1V; Type: I16; (raw value:32767 = 3277 V); USS-Adr: 12 08 00 00 hex	4220h	0h

R.. Production data			
Par.	**Description**	**Fieldbus-address**	
R33 Global read (3)	**Maximum motor power:** Maximum power which a motor that is operated on this inverter may have. Represents the upper limit for **B11**. Fieldbus: 1LSB=0,001kW; Type: I16; (raw value:1LSB=0,01·kW); USS-Adr: 12 08 40 00 hex	4221h	0h
R34 Global read (3)	**Maximum brakeresistor power:** Maximum power which a brake resistor that is connected to this inverter may have. Represents the upper limit for **A22**. Fieldbus: 1LSB=1W; Type: I16; (raw value:1LSB=10·W); USS-Adr: 12 08 80 00 hex	4222h	0h
R35 Global read (3)	**Minimum brakeresistor resistance:** Minimum resistance value which a braking resistor connected to this inverter must have. Represents the lower limit for **A21**. Fieldbus: 1LSB=1Ohm; Type: I16; (raw value:32767 = 3277 Ohm); USS-Adr: 12 08 C0 00 hex	4223h	0h
R36.0 Global read (3)	**Hardware-version control-unit for hardware:** Number specifying the hardware version of the control unit. All changes in the hardware states are counted here. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 12 09 00 00 hex	4224h	0h
R36.1 Global read (3)	**Hardware-version control-unit for software:** Number specifying the hardware version of the control unit. All changes in the hardware states which require a software adjustment are counted here. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 12 09 00 01 hex	4224h	1h

T.. Scope			
Par.	**Description**	**Fieldbus-address**	
T25 Global r=3, w=3	**Automatic scope start:** When **T25** is *"1:active,"* Scope starts automatically after the configuration is downloaded. With a device new start, Scope is also automatically started with the settings saved last. *0: inactive;* *1: active;* Fieldbus: 1LSB=1; Type: B; USS-Adr: 14 06 40 00 hex	4619h	0h

U.. Protection functions			
Par.	**Description**	**Fieldbus-address**	
U00 Global r=3, w=3	**Level low voltage:** Level at which the event *"46:low voltage*" is triggered due to cause "*1:low voltage DC link voltage limit.*" *2: Warning;* After the tolerance time in **U01** expires, the device assumes fault status. *3: Fault;* When the value in **A35** is passed below, the device immediately assumes fault status. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 00 00 00 hex	4800h	0h
U01 Global r=3, w=3	**Time low voltage:** Can only be set with **U00**=*2:Warning.* Defines the time during which the triggering of low voltage monitoring is tolerated. After expiration of this time, the device assumes fault status. *Value range in s: 1.00 ... 1,00 ... 10.00* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 00 40 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4801h	0h

U.. Protection functions			
Par.	**Description**	**Fieldbus-address**	
U02 Global r=3, w=3	**Level overtemperature Device i2t:** Parallel to the monitoring of the heat dissipater temperature, an additional protective function is offered via i²t. The device load can be indicated as a percentage via parameter **E22**. If the value in **E22** is greater than 100%, **U02** is triggered. *0: inactive;* Device does not react to the triggering of **U02**. *1: Message;* When **U02** is triggered, this is only indicated. The device continues to remain ready for operation. *2: Warning;* After expiration of the tolerance time in **U03**, the device assumes fault status (for E39, see chap. 17). *3: Fault;* After **U02** is triggered, the device immediately assumes fault status (for E39, see chap. 17). Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 00 80 00 hex	4802h	0h
U03 Global r=3, w=3	**Time overtemperature Device i2t:** Can only be set with **U02**=*2:Warning*. Defines the time during which a trigger of the i²t monitoring is tolerated. After expiration of this time, the device assumes fault status. *Value range in s: 1.00 ... 10,00 ... 60.00* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 00 C0 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4803h	0h
U10 Global r=3, w=3	**Level temperature motor i2t:** Parallel to the monitoring of the positor line on the motor, the inverter simulates the motor temperature via an i²t model. The motor load is indicated as a percentage in parameter **E23**. If the value in **E23** is greater than 100%, **U10** is triggered. *0: inactive;* Device does not react to the triggering of **U10**. *1: Message;* Triggering of **U10** is only indicated. The device continues to be ready for operation. *2: Warning;* After expiration of the tolerance time **U11**, the device assume fault status. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 02 80 00 hex	480Ah	0h
U11 Global r=3, w=3	**Time temperature motor i2t:** Can only be set when **U10**=*2:Warning*. Defines the time during which a trigger of i²t monitoring is tolerated. After expiration of this time, the device assumes fault status. *Value range in s: 1.00 ... 30,00 ... 60.00* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 02 C0 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	480Bh	0h
U12 Global r=3, w=3	**Level motor connection:** When the axis switch via POSISwitch® is utilized, the inverter can test during switching whether the contactor of the motor to be switched off has actually broken contact (opened). In addition, under certain circumstances, it can be determined that no motor is connected. *0: inactive;* *3: Fault;* Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 03 00 00 hex	480Ch	0h
U15 Global r=3, w=3	**Level MotorTMP:** Trips when the motor temperature sensor on X2 triggers. *2: Warning;* After expiration of the tolerance time **U16**, the device assume fault status. *3: Fault;* The device immediately assumes fault status after the motor TMP is triggered. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 03 C0 00 hex	480Fh	0h
U16 Global r=3, w=3	**Time MotorTMP:** Can only be set when **U15**=*2:Warning*. Defines the time during which triggering of the motor TMP is tolerated. After expiration of this time, the device assumes fault status. *Value range in s: 1.00 ... 2,00 ... 60.00* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 04 00 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4810h	0h

U.. Protection functions			
Par.	**Description**	**Fieldbus-address**	
U20 Axis r=3, w=3	**Level M-Max limit:** When the calculated motor torque exceeds the current torque limit in **E62** during stationary operation, **U20** is triggered. *0: inactive;* Device does not react to the triggering of **U20**. *1: Message;* Triggering of **U20** is only indicated. The device continues to remain ready for operation. *2: Warning;* After expiration of the tolerance time in **U21**, the device assumes fault status. *3: Fault;* The device immediately assumes fault status after **U20** is triggered. Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 05 00 00 hex	4814h	0h
U21 Axis r=3, w=3	**Time M-Max limit:** Can only be set when **U20**=*2:Warning*. Defines the time during which a drive overload is tolerated. After expiration of this time, the device assumes fault status. *Value range in s: 1.00 ... 10,00 ... 60.00* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 05 40 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4815h	0h
U80 Axis r=3, w=3	**Fault sample parameter 0:** Each of the 10 fault memory entries has space for user-defined data which are also saved when a fault is triggered. The parameter to be recorded is set here. *Value range: A00 ... E91 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 15 14 00 00 hex	4850h	0h
U81 Axis r=3, w=3	**Fault sample parameter 1:** Each of the 10 fault memory entries has space for user-defined data which are also saved when a fault is triggered. The parameter to be recorded is set here. *Value range: A00 ... E00 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 15 14 40 00 hex	4851h	0h
U82 Axis r=3, w=3	**Fault sample parameter 2:** Each of the 10 fault memory entries has space for user-defined data which are also saved when a fault is triggered. The parameter to be recorded is set here. *Value range: A00 ... E90 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 15 14 80 00 hex	4852h	0h
U83 Axis r=3, w=3	**Fault sample parameter 3:** Each of the 10 fault memory entries has space for user-defined data which are also saved when a fault is triggered. The parameter to be recorded is set here. *Value range: A00 ... E191 ... A.Gxxx.yyyy (Parameter number in plain text)* Fieldbus: 1LSB=1; Type: U32; raw value:USS-Adr; USS-Adr: 15 14 C0 00 hex	4853h	0h
U100 Axis r=3, w=3	**Level application event 0:** Application-specific event no. 60. Starting with the level *"1:Message,"* the display shows the event number with the text specified in **U102** (e.g., "*60:My fault*") when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 19 00 00 hex	4864h	0h
U101 Axis r=3, w=3	**Time application event 0:** Can only be set with **U100**=*2:Warning*. Defines the time during which the event remains a warning. After expiration of this time, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 19 40 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4865h	0h
U102 Axis r=3, w=3	**Text application event 0:** Text which appears on the display when the event is triggered. *Default setting: Range 1 lowerLim* Fieldbus: Type: Str16; USS-Adr: 15 19 80 00 hex	4866h	0h

U.. Protection functions			
Par.	**Description**	**Fieldbus-address**	
U110 Axis r=3, w=3	**Level application event1:** Application-specific event no. Nr. 61. Starting with the level *"1:Message,"* the display shows the event number with the text specified in **U112** (e.g., "*61:My fault"*) when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 1B 80 00 hex	486Eh	0h
U111 Axis r=3, w=3	**Time application event 1:** Can only be set when **U110**=*2:Warning*. Defines the time during which the event remains a warning. After expiration of this time, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 1B C0 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	486Fh	0h
U112 Axis r=3, w=3	**Text application event 1:** Indication which appears on the display when the event is triggered. *Default setting: Range 1 upperLim* Fieldbus: Type: Str16; USS-Adr: 15 1C 00 00 hex	4870h	0h
U120 Axis r=3, w=3	**Level application event 2:** Application-specific event no. 62. Starting with the level *"1:Message,"* the event number and the text specified in **U122** (e.g., *"62:My fault"*) appear on the display when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 1E 00 00 hex	4878h	0h
U121 Axis r=3, w=3	**Time application event 2:** Can only be set when **U120**=*2:Warning*. Defines the time during which the event remains a warning. After expiration of this time, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 1E 40 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4879h	0h
U122 Axis r=3, w=3	**Text application event 2:** Indication which appears on the display when the event is triggered. *Default setting: Range 2 lowerLim* Fieldbus: Type: Str16; USS-Adr: 15 1E 80 00 hex	487Ah	0h
U130 Axis r=3, w=3	**Level application event 3:** Application-specific event no. 63. Starting with level *"1:Message,"* the event number and the text specified in **U132** (e.g., *"63:My fault"*) appear on the display when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 20 80 00 hex	4882h	0h
U131 Axis r=3, w=3	**Time application event 3:** Can only be set when **U130**=*2:Warning*. Defines the time during which the event remains a warning. After this time expires, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 20 C0 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4883h	0h

U.. Protection functions			
Par.	**Description**	**Fieldbus-address**	
U132 Axis r=3, w=3	**Text application event 3:** Indication which appears on the display when the event is triggered. *Default setting: Range 2 upperLim* Fieldbus: Type: Str16; USS-Adr: 15 21 00 00 hex	4884h	0h
U140 Axis r=3, w=3	**Level application event 4:** Application-specific event no. 64. Starting with the level *"1:Message,"* the event number and the text specified in **U142** (e.g., *"64:My fault"*) appear on the display when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 23 00 00 hex	488Ch	0h
U141 Axis r=3, w=3	**Time application event 4:** Can only be set when **U140**=*2:Warning*. Defines the time during which the event remains a warning. After this time expires, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 23 40 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	488Dh	0h
U142 Axis r=3, w=3	**Text application event 4:** Indication which appears on the display when the event is triggered. *Default setting: currentloop lost* Fieldbus: Type: Str16; USS-Adr: 15 23 80 00 hex	488Eh	0h
U150 Axis r=3, w=3	**Level application event 5:** Application-specific event no. 65. Starting with the level *"1:Message,"* the event number and the text specified in **U152** (e.g., *"65:My fault"*) appear on the display when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 25 80 00 hex	4896h	0h
U151 Axis r=3, w=3	**Time application event 5:** Can only be set when **U150**=*2:Warning*. Defines the time during which the event remains a warning. After this time expires, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 25 C0 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	4897h	0h
U152 Axis r=3, w=3	**Text application event 5:** Indication which appears on the display when the event is triggered. *Default setting: limit switch* Fieldbus: Type: Str16; USS-Adr: 15 26 00 00 hex	4898h	0h
U160 Axis r=3, w=3	**Level application event 6:** Application-specific event no. 66. Starting with level *"1:Message,"* the event number and the text specified in **U162** (e.g., *"66:My fault"*) appear on the display when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 28 00 00 hex	48A0h	0h

U.. Protection functions			
Par.	**Description**	**Fieldbus-address**	
U161 Axis r=3, w=3	**Time application event 6:** Can only be set when **U160**=*2:Warning*. Defines the time during which the event remains a warning. After this time expires, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 28 40 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	48A1h	0h
U162 Axis r=3, w=3	**Text application event 6:** Indication which appears on the display when the event is triggered. *Default setting: Ext6* Fieldbus: Type: Str16; USS-Adr: 15 28 80 00 hex	48A2h	0h
U170 Axis r=3, w=3	**Level application event 7:** Application-specific event no. 67. Starting with level *"1:Message,"* the event number and the text specified in **U172** (e.g., *"67:My fault"*) appear on the display when this event occurs. *0: inactive*; *1: Message*; *2: Warning*; *3: Fault*; Fieldbus: 1LSB=1; Type: U8; USS-Adr: 15 2A 80 00 hex	48AAh	0h
U171 Axis r=3, w=3	**Time application event 7:** Can only be set when **U170**=*2:Warning*. Defines the time during which the event remains a warning. After this time expires, the device assumes fault status. *Value range in s: 0.00 ... 0,00 ... 63.75* Fieldbus: 1LSB=0,01s; Type: U8; (raw value:2 Bit=1·s); USS-Adr: 15 2A C0 00 hex 👁 Only when the appropriate event level is parameterized to *2:Warning*.	48ABh	0h
U172 Axis r=3, w=3	**Text application event 7:** Indication which appears on the display when the event is triggered. *Default setting: Ext7* Fieldbus: Type: Str16; USS-Adr: 15 2B 00 00 hex	48ACh	0h
U180 Axis r=2, w=2	**Text external fault 1:** In addition to the 8 external events whose level (fault, warning, and so on) can be specified as desired by the user, two other events which always trigger a fault are available for application development. The related fault messages are specified by the parameters **U180** and **U181**. *Default setting: ExtFault1* Fieldbus: Type: Str16; USS-Adr: 15 2D 00 00 hex	48B4h	0h
U181 Axis r=2, w=2	**Text external fault 2:** See **U180**. *Default setting: ExtFault2* Fieldbus: Type: Str16; USS-Adr: 15 2D 40 00 hex	48B5h	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z31 Global read (3)	**Short/ground.:** The parameter indicates how frequently event 31:Short/ground has occurred. Event description:: Trigger: The hardware overcurrent switchoff is active. Cause: • The motor requires too much current from the inverter (interwinding fault, overload) Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: The motor always coasts down. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 07 C0 00 hex	521Fh	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z32 Global read (3)	**Short/ground internal:** The parameter indicates how frequently event 32:Short/ground internal has occurred. Event description: Trigger: An internal check is performed when the inverter is enabled. An existing short circuit will cause a fault. Cause: • An internal device error exists. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment Other: The motor always coasts down. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 08 00 00 hex	5220h	0h
Z33 Global read (3)	**Overcurrent:** The parameter indicates how frequently event 33:Overcurrent has occurred. Event description: Trigger: The total motor current exceeds the permissible maximum. Cause: • Acceleration times too short • Wrong torque limitations in parameters **C03** and **C05** Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: The motor always coasts down. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 08 40 00 hex	5221h	0h
Z34 Global read (3)	**Hardware fault:** The parameter indicates how frequently event 34:Hardware fault has occurred. Event description: Trigger: A hardware error occurred. Cause: ***1: FPGA;*** error while loading the FPGA. ***2: NOV-ST;*** control unit memory defective (FERAM). ***3: NOV-LT;*** power unit memory defective (EEPROM). ***10: ST <-> LT;*** power unit serial number does not match. requirement in control unit. ***11: CurrentMeas;*** current offset measurement when device starts up - deviation too great Level: Fault Acknowledgment: Cannot be acknowledged Other: The inverter must be sent in for repairs. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 08 80 00 hex	5222h	0h
Z35 Global read (3)	**Watchdog:** The parameter indicates how frequently event 35:Watchdog has occurred. Event description: Trigger: The watchdog of the microprocessor has triggered. Cause: • The microprocessor is busy or it is faulty. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: The motor always coasts down. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 08 C0 00 hex	5223h	0h
Z36 Global read (3)	**High voltage:** The parameter indicates how frequently event 36:High voltage has occurred. Event description: Trigger: The voltage in the DC link exceeds permissible maximum (indication DC link voltage in **E03**). Cause: • Network voltage too high • Feedback of drive in braking mode (no brake resistor connected brake chopper deactivated with **A20**=inactive or defective). • Brake resistor too low (overcurrent protection) • Ramp too steep Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: The motor always coasts down. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 09 00 00 hex	5224h	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z37 Global read (3)	**Encoder:** The parameter indicates how frequently event 37:encoder has occurred. Event description: Trigger: Error by encoder. Cause: ***1: Para <-> encoder;*** parameterization does not match connected encoder. ***2: ParaChgOffOn;*** *Parameterchange;* encoder parameterization cannot be changed during operation. Save and then turn device off and on so that the change takes effect. ***4: Chan.A/Clk;*** wire break, track A / clock ***5: Chan.B/Dat;*** wire break, track B / data ***6: Chan.0;*** wire break, track 0 ***7: EnDatAlarm;*** The EnDat® encoder reported an alarm. ***8: EnDatCRC;*** The EnDat® encoder reported that too many errors were found during the redundancy check. The cause can be wirebreak or errors in the cable shield. ***9: Comm.Offset;*** commutating offset is not correct. ***10: Resol.carrier;*** resolver is not or wrong connected, wirebreak is possible ***11: Resol.undervolt.;*** wrong transmission factor ***12: Resol.overvolt.;*** wrong transmission factor ***13: Resol.parameter;*** ***14: Resol.failure;*** wirebreak ***15: X120-double tr.;*** X120 double transmission occurred ***16: X120-Busy;*** encoder gave no response for too long; bei SSI-Slave: bei freigegebenen Antrieb seit 5 ms keine Telegramm ***17: X120-wirebreak;*** ***18: X120-Timeout;*** ***19: X4-double tr.;*** X4 double transmission occurred ***20: X4-Busy;*** encoder gave no response for too long ***21: X4-wirebreak;*** **22: AX5000;** acknowledgment of the axis switch is not effected. **23: *Ax5000required*;** comparison of **E57** and **E70**. ***24: X120-speed*; B297**, **G297** or **I297** exceeded. ***25: X4-speed*; B297**, **G297** or **I297** exceeded. ***26: No Enc. found*;** either no encoder was found on X4 or the EnDat®/SSI encoder has a wire break. ***27: AX5000 found***; a functional AX 5000 option board was found on X4 although incremental encoder or EnDat® encoder was parameterized, or no EnDat® encoder is connected to the AX 5000 option board. ***28: EnDat found.***; an EnDat® encoder was found on X4 although another encoder was parameterized. ***29: AX5000/IncEnc***; either X4 has a faulty AX 5000 option board or the A-track of an incremental encoder has a wire break. ***30: Opt2 incomp.;*** Version of option 2 is not current. Level: Fault Acknowledgment: Turn the device off/on for causes 7, 10, 11, 12, 13 and 14. Programmed acknowledgment for other causes. Other: The motor always coasts down. Caution: With positioning applications, the reference is deleted by the event "37:encoder." After acknowledgment, referencing must be performed again. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 09 40 00 hex	5225h	0h
Z38 Global read (3)	**Overtemp.device sensor:** The parameter indicates how frequently event 38:Overtemp.device sensor has occurred. Event description: Trigger: The temperature measured by the device sensor exceeds the permissible maximum value or is below the permissible minimum value. Cause: • Ambient/switching cabinet temperatures too high or to low. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: The permissible temperatures are stored on the power section of the inverter. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 09 80 00 hex	5226h	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z39 Global read (3)	**Overtemp.device i2t:** The parameter indicates how frequently event 39:Overtemp.device i2t has occurred. Event description: Trigger: The i^2t model for the inverter exceeds 100% of the thermal load. Cause: • Inverter overloaded (e.g., because motor blocked). • Too high clock pulse frequency. Level: Inactive, message, warning or fault, can be parameterized in **U02** (Default: fault). Other: When the event is triggered, a current limitation occurs initially for control types servo and vector control. At the same time, a quick stop is triggered as a fault when parameterized in **U02**. Reduction of the current may mean that the quick stop is no longer executed correctly! Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 09 C0 00 hex	5227h	0h
Z40 Global read (3)	**Invalid data:** The parameter indicates how frequently event 40:Invalid data has occurred. Event description: Trigger: A data error was detected when the non-volatile memory was initialized. Cause: ***1 to 7:*** **Control unit memory** ***1: Fault;*** low-level read/write error or timeout. ***2: BlockMiss;*** unknown data block. ***3: DatSecur;*** block has no data security. ***4: Checksum;*** block has checksum error. ***5: R/o;*** block is r/o. ***6: ReadErr;*** startup phase: block read error. ***7: BlockMiss;*** block not found . ***17 to 23:*** **power unit memory** ***17: Fault;*** low-level read/write error or timeout. ***18: BlockMiss;*** unknown data block. ***19: DatSecur;*** block has no data security. ***20: Checksum;*** block has checksum error. ***21: R/o;*** block is r/o. ***22: ReadErr;*** startup phase: block read error. ***23: BlockMiss;*** block not found. ***32 and 33:*** **encoder memory** ***32: el. mot-type;*** no nameplate data present. ***33: el.typeLim;*** elecronic motor-type limit; nameplate parameters cannot be entered. ***48: Optionmodule2;*** error in memory of option 2 with REA 5000 and XEA 5000 and XEA 5001 respectively. Level: Fault Acknowledgment: The event cannot be acknowledged for cause 1 to 23 and 48. The inverter must be sent in for repairs. The event can be acknowledged for causes 32 and 33. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0A 00 00 hex	5228h	0h
Z41 Global read (3)	**Temp.MotorTMP:** The parameter indicates how frequently event 41:Temp.MotorTMP has occurred. Event description: Trigger: Motor temperature sensor reports excess temperature. (Connection terminals X2.3, X2.4). Cause: • The motor is overloaded. • The temperature sensor is not connected. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0A 40 00 hex	5229h	0h
Z42 Global read (3)	**TempBrakeRes:** The parameter indicates how frequently event 42:TempBrakeRes has occurred. Event description: Trigger: The i^2t model for the brake resistor exceeds 100% of the load. Cause: • The brake resistor may not be adequate for the application. Level: Fault Acknowledgment: Programmed acknowledgment. Acknowledgment by turning the device off/on is not recommended since the i^2t model would be reset to 80% in this case and there is a danger of the deceleration resistor being damaged. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0A 80 00 hex	522Ah	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z44 Global read (3)	**External fault 1:** The parameter indicates how frequently event 44:External fault 1 has occurred. Event description: Trigger: Application specific or by free programming option. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: Should only be used for application events which may not be set lower than the "fault" level. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0B 00 00 hex	522Ch	0h
Z45 Global read (3)	**Overtemp.motor i2t:** The parameter indicates how frequently event 45:Overtemp.motor i2t has occurred. Event description: Trigger: The i^2t model for the motor has reached 100% of load. Cause: • The motor is overloaded. Level: Can be parameterized as inactive, message or warning in **U10** and **U11**. Acknowledgment: Turn device off/on or programmed acknowledgment. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0B 40 00 hex	522Dh	0h
Z46 Global read (3)	**Low voltage:** The parameter indicates how frequently event 46:Low voltage has occurred. Event description: Trigger: The DC link voltage is lower than the limit value set in **A35**. Cause: ***1: Low Voltage;*** the value in **E03** DC-link-voltage has dropped below the value parameterized in **A35** low voltage limit. ***2: Network phase;*** phase monitoring has found that a switched-on power unit is missing a phase. ***3: Drop in network;*** when phase monitoring finds that the network voltage is missing, the charging relay is immediately switched off. Normal operation is maintained. If the power unit is still switched on after network voltage returns, a fault is triggered after 0.5 s. Level: Can be parameterized for cause 1 in **U00** and **U01**. Warning with 10-second warning time for cause 2, fault for cause 3. Acknowledgment: Can be acknowledged for "fault" level by turning device off/on or programmed acknowledgment. Other: The motor always coasts down for cause 3. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0B 80 00 hex	522Eh	0h
Z47 Global read (3)	**Torque limit:** The parameter indicates how frequently event 47:Torque limit has occurred. Event description: Trigger: The maximum torque permitted for static operation is exceeded for the control types servo control, vector control or senorless vector control (**E62**:act. pos. M-max, **E66**:act. neg. M-max). Cause: • Limitation by parameters **C03** and **C05**. Level: Can be parameterized in **U20** and **U21**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0B C0 00 hex	522Fh	0h
Z52 Global read (3)	**Communication:** The parameter indicates how frequently event 52:Communication has occurred. Event description: Trigger: Communication fault Cause: ***1: CAN LifeGuard;*** recognized the "life-guarding-event" (master no longer sends RTR). ***2: CAN Sync Error;*** sync message was not received within the time set in CANOpen object with index 1006 (cycle period timeout ***3: CAN Bus Off;*** went off when bus went off. The driver started it again. ***4: PZD-Timeout;*** failure of the cyclic data connection (PROFIBUS). ***5: USS;*** (under preparation) failure of the cyclic data connection (USS). ***6: Systembus;*** (under preparation) Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0D 00 00 hex	5234h	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z55 Global read (3)	**Option board:** The parameter indicates how frequently event 55:Option board has occurred. Event description: Trigger: Error during operation with option board. Cause: ***1: CAN 5000 failure;*** CAN 5000 was recognized, installed and failed. ***2: DP 5000 failure;*** DP5000 was recognized, installed and failed. ***3: REA 5000 failure;*** REA 5000 was recognized, installed and failed. ***4: SEA 5000 failure;*** SEA 5000 was recognized, installed and failed. ***5: XEA 5000 failure;*** XEA 5000 or XEA 5001was recognized, installed and failed. ***6: EncSim-init;*** could not be initialized on XEA. The motor may have turned during initialization. ***7: WrongOption;*** wrong or nonexisting option board (compar. **E54**/**E58** with **E68**/**E69**) ***8: LEA5000 failure;*** LEA 5000 was recognized, installed and failed. ***9: ECS5000 failure;*** ECS 5000 was recognized, installed and failed.. ***10: 24V failure;*** Failure of the 24 V supply for XEA 5001 or LEA 5000. ***11:SEA 5001 failure;*** SEA 5001 was recognized, installed and failed. Level: Fault Acknowledgment: Turn device off/on for all causes or programmed acknowledgment of causes 1 to 6 and 8 to 10. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0D C0 00 hex	5237h	0h
Z56 Global read (3)	**Overspeed:** The parameter indicates how frequently event 56:Overspeed has occurred. Event description: Trigger: The measured speed is greater than **C01***1,1 + 100 rpm. Cause: • Encoder defective Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: The motor always coasts down (from V5.0D on). Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0E 00 00 hex	5238h	0h
Z57 Global read (3)	**Runtime usage:** The parameter indicates how frequently event 57:Runtime usage has occurred. Event description: Trigger: The cycle time of a real-time task was exceeded. Cause: ***2: RT2;*** cycle time of real-time task 2 exceeded (1 msec) ***3: RT3;*** cycle time of real-time task 3 exceeded (technology task) ***4: RT4;*** cycle time of real-time task 4 exceeded (32 msec) ***5: RT5;*** cycle time of real-time task 5 exceeded (256 msec) Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0E 40 00 hex	5239h	0h
Z58 Global read (3)	**Grounded:** The parameter indicates how frequently event 58:Grounded has occurred. Event description: Trigger: Hardware signal from power section with MDS 5000 BG3. Cause: • Asymmetrical motor currents. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: The motor always coasts down. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0E 80 00 hex	523Ah	0h
Z59 Global read (3)	**Overtemp.device i2t:** The parameter indicates how frequently event 59:Overtemp.device i2t has occurred. Event description: Trigger: The i^2t model calculated for the inverter exceeds 105% of the thermal load. Cause: • Inverter overloaded (e.g., because motor is blocked). • Clock pulse frequency too high. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0E C0 00 hex	523Bh	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z60 Global read (3)	**Application event 0:** The parameter indicates how frequently event 60:Application event 0 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U100**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: **- Message/warning:** Evaluation in 256-msec cycle. **- Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0F 00 00 hex	523Ch	0h
Z61 Global read (3)	**Application event 1:** The parameter indicates how frequently event 61:Application event 1 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U110**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: **- Message/warning:** Evaluation in 256-msec cycle. **- Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0F 40 00 hex	523Dh	0h
Z62 Global read (3)	**Application event 2:** The parameter indicates how frequently event 62:Application event 2 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U120**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: **- Message/warning:** Evaluation in 256-msec cycle. **- Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0F 80 00 hex	523Eh	0h
Z63 Global read (3)	**Application event 3:** The parameter indicates how frequently event 63:Application event 3 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U130**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: **- Message/warning:** Evaluation in 256-msec cycle. **- Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 0F C0 00 hex	523Fh	0h
Z64 Global read (3)	**Application event 4:** The parameter indicates how frequently event 64:Application event 4 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U140**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: **- Message/warning:** Evaluation in 256-msec cycle. **- Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 10 00 00 hex	5240h	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z65 Global read (3)	**Application event 5:** The parameter indicates how frequently event 65:Application event 5 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U150**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: - **Message/warning:** Evaluation in 256-msec cycle. - **Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 10 40 00 hex	5241h	0h
Z66 Global read (3)	**Application event 6:** The parameter indicates how frequently event 66:Application event 6 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U160**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: - **Message/warning:** Evaluation in 256-msec cycle. - **Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 10 80 00 hex	5242h	0h
Z67 Global read (3)	**Application event 7:** The parameter indicates how frequently event 67:Application event 7 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U170**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: - **Message/warning:** Evaluation in 256-msec cycle. - **Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 10 C0 00 hex	5243h	0h
Z68 Global read (3)	**External fault 2:** The parameter indicates how frequently event 68:External fault 2 has occurred. Event description: Trigger: Application specific or by free programming option. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: Should be used for application events which can only be parameterized at the "fault" level. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 11 00 00 hex	5244h	0h
Z69 Global read (3)	**Motor connection:** The parameter indicates how frequently event 69:Motor connection has occurred. Event description: Trigger: Connection error of the motor. Cause: ***1: MotorNotDiscon;*** the contactor did not open when the axis changed. This cause can only be determined when at least two phase contacts are stuck and the DC link is charged (see **E03**). No magnetization could be established with asynchronous motors. ***2: No motor;*** possibly no motor connected or line to motor interrupted. Level: Can be parameterized as inactive or warning in **U12**. Acknowledgment: Turn device off/on or programmed acknowledgment. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 11 40 00 hex	5245h	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
Z70 Global read (3)	**Parameter consistency:** The parameter indicates how frequently event 70:Parameter consistency has occurred. Event description: Trigger: The parameterization is contradictory. Cause: ***1: no servoencoder;*** *n*o servo-type encoder; control mode **B20** is set to "servo" but no appropriate encoder is selected (**B26**, **H..** parameter). ***2: X120 direction;*** X120 is used as source in one parameter but is parameterized in **H120** as drain (or vice versa). ***3: B12<->B20;*** Control mode **B20** is not set to servo but the nominal motor current (**B12**) exceeds the 4-kHz nominal current (**R24**) of the device by more than 1.5 times. ***4: B10<->H31;*** Resolver/motorpoleno.; the set motor pole number (**B10**) and the resolver pole number (**H31**) do not match. ***5: neg.slip;*** with the control modes V/f, SLVC or VC (**B20**). The values for motor nominal speed (**B13**), motor nominal frequency (**B15**) and motor pole number (**B10**) indicate a negative slip. ***7: B26:SSI-Slave;*** *SSI slave* may not be used as motor encoder (synchronization problems). ***8: C01>B83;*** **C01** may not be greater than **B83**. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: With an incorrect parameterization, a fault is not triggered until enabling takes place. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 11 80 00 hex	5246h	0h

Z.. Fault counter			
Par.	**Description**	**Fieldbus-address**	
	Level: Can be parameterized in system parameters **U160**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: - **Message/warning:** Evaluation in 256-msec cycle. - **Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 10 80 00 hex		
Z67 Global read (3)	**Application event 7:** The parameter indicates how frequently event 67:Application event 7 has occurred. Event description: Trigger: Application specific or by free programming option. Cause: • Can be programmed as desired for each axis separately. Level: Can be parameterized in system parameters **U170**. Acknowledgment: Turn device off/on or programmed acknowledgment. Other: - **Message/warning:** Evaluation in 256-msec cycle. - **Fault:** Evaluation in parameterizable cycle time (**A150**). Texts, times and level can be set in parameter group **U..** starting with **U100**. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 10 C0 00 hex	5243h	0h
Z68 Global read (3)	**External fault 2:** The parameter indicates how frequently event 68:External fault 2 has occurred. Event description: Trigger: Application specific or by free programming option. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: Should be used for application events which can only be parameterized at the "fault" level. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 11 00 00 hex	5244h	0h
Z69 Global read (3)	**Motor connection:** The parameter indicates how frequently event 69:Motor connection has occurred. Event description: Trigger: Connection error of the motor. Cause: ***1: MotorNotDiscon;*** the contactor did not open when the axis changed. This cause can only be determined when at least two phase contacts are stuck and the DC link is charged (see E03). No magnetization could be established with asynchronous motors. ***2: No motor;*** possibly no motor connected or line to motor interrupted. Level: Can be parameterized as inactive or warning in **U12**. Acknowledgment: Turn device off/on or programmed acknowledgment. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 11 40 00 hex	5245h	0h
Z70 Global read (3)	**Parameter consistency:** The parameter indicates how frequently event 70:Parameter consistency has occurred. Event description: Trigger: The parameterization is inconsistent. Cause: ***1: no servoencoder;*** *n*o servo-type encoder; control mode **B20** is set to "servo" but no appropriate encoder is selected (**B26**, **H..** parameter). ***2: X120 direction;*** X120 is used as source in one parameter but is parameterized in **H120** as drain (or vice versa). ***3: B12<->B20;*** Control mode **B20** is not set to servo but the nominal motor current (**B12**) exceeds the 4-kHz nominal current (**R24**) of the device by more than 1.5 times. ***4: B10<->H31;*** Resolver/motorpoleno.; the set motor pole number (**B10**) and the resolver pole number (**H31**) do not match. ***5: neg.slip;*** with the control modes V/f, SLVC or VC (**B20**). The values for motor nominal speed (**B13**), motor nominal frequency (**B15**) and motor pole number (**B10**) indicate a negative slip. ***7: B26:SSI-Slave;*** *SSI slave* may not be used as motor encoder (synchronization problems). ***8: C01>B83;*** **C01** may not be greater than **B83**. Level: Fault Acknowledgment: Turn device off/on or programmed acknowledgment. Other: With an incorrect parameterization, a fault is not triggered until enabling takes place. Fieldbus: 1LSB=1; Type: U16; USS-Adr: 1A 11 80 00 hex	5246h	0h

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Publication: No. 441843.00.01 · 04.2007
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